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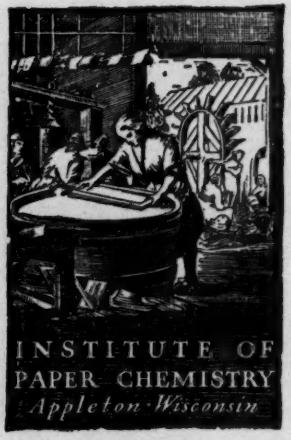
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

DECEMBER • 1950
Volume 21 Number 4

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Books and Pamphlets Added to the Library During November

CANADA—STATISTICS

CANADA. *Dominion Bureau of Statistics.* The Canada year book, 1950; the official statistical annual of the resources, history, institutions, and social and economic conditions of Canada. Ottawa, Edmond Cloutier, King's printer . . . 1950. 1238 p.

CARBOHYDRATES

PERCIVAL, E. G. V. Structural carbohydrate chemistry. London, Frederick Muller Ltd. [1950] 246 p.

CELLULOSE

TIMELL, TORE. Studies on cellulose reactions. Stockholm [Esselte aktiebolag] 1950. 275 p.

TIMELL, TORE. Studies on cellulose reactions. Ingeniörsvetenskapsakademiens handlingar nr. 205 [rev.] Stockholm, Generalstabens Litografiska Anstalts Förlag, 1950. 275 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilstein's Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer Verlag, 1950. 12. Band. 976 p.

DRYING (FRUITS AND VEGETABLES)

SELTZER, EDWARD, and SETTELMEYER, JAMES T. Spray drying of foods. Reprinted from Advances in food research, volume II, 1949. New York, Academic Press, 1949. p. 399-520.

ELECTRON MICROSCOPE

MARTON, CLAIRE, SASS, SAMUEL, SWERDLOW, MAX, VANBRONKHORST, ALAN, and MERYMAN, HAROLD. Bibliography on electron microscopy. National Bureau of Standards circular 502. Washington, U. S. Govt. Print. Off., 1950. 87 p.

FIRE PREVENTION

SCHWARTZ, VON. Fire and explosion risks, a handbook dealing with the detection, investigation and prevention of dangers arising from fires and explosions of chemico-technical substances and establishments. Translated from the rev. German ed. by Charles T. C. Salter. 5th ed. London, Charles Griffin and Co., 1946. 357 p.

FISHING

THE FISHERMAN'S ENCYCLOPEDIA. Ira N. Gabrielson, editor; Francesca Lamonte, associate editor. New York, Stackpole & Heck [c1950] 698 p.

GERMAN LANGUAGE

LEIBIGER, O. W., and LEIBIGER, I. S. German-English and English-German dictionary for scientists, comprising chemistry, physics, mathematics, engineering, aeronautics, dynamics, biology, physiology, medicine, and other sciences. Ann Arbor, Mich., J. W. Edwards, 1950. 360 p.

MICRO-ORGANISMS

ANNUAL REVIEW of microbiology. Charles E. Clifton, editor; Sidney Raffel and H. Albert Barker, associate editors. Stanford, Annual Reviews, Inc., 1950. v. 4. 383 p.

MOLECULES

SYRKIN, Y. K., and DYATKINA, M. E. Structure of molecules and the chemical bond. Translated and revised by M. A. Partridge and D. O. Jordan. New York, Interscience Publishers; London, Butterworths Scientific Publications, 1950. 509 p.

SOUND—RECORDING AND REPRODUCING

READ, OLIVER. The recording and reproduction of sound. Indianapolis, Howard W. Sams & Co., 1949. 364 p.

TRADE DIRECTORIES

HUGO BRUSEWITZ AB, *Gothenburg,* ed. Paper and pulp makers, 1950-1951; directory of Sweden, Norway, Denmark and Finland. With the co-operation of Ewert Landberg, Björn Lyche, and Onni O. Ojala. 18th English ed. Gothenburg, Sweden, Hugo Brusewitz AB, 1950. 340 p.

LOCKWOOD'S directory of the paper and allied trades. 76th ed., 1951. New York, Lockwood Trade Journal Co., Inc., c1950. 1471 p.

SOURCE of supply directory. Chicago, Howard Publ. Co., 1950. v. 25. 798 p.

WATER—POLLUTION

HALME, ERKKI. Die Abwasserfrage der Zellstoffwerke im Lichte einiger fischtoxikologischen Versuche. Annales Zoologici Societatis Zoologicae Botanicae Fennicae "Vanamo." Tom. 13, No. 7. Helsinki, The Society, 1950. 118 p.

WOOD-PULP

UNITED STATES PULP PRODUCERS ASSOCIATION. Wood pulp statistics, 1950 ed. New York, The Association, 1950. 211 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

AULIN-ERDTMAN, GUNHILD. Studies in the tropolone series. I. Thujaplicins and nootkatin. Acta Chem. Scand. 4, no. 7: 1031-41 (1950). [In English]

Ultraviolet absorption spectra for the thujaplicins and for a new compound, nootkatin, $C_{15}H_{20}O_2$, m. p. 91.5-92°C. (from the heartwood of *Chamaecyparis nootkatensis*) are given. A potentiometric titration curve for β-thujaplicin and molecular-weight determinations of the latter and nootkatin are given. These properties are discussed in connection with known properties of the tropolones. The molecule is planar and does not associate. The problem of an intramolecular hydrogen bond is discussed, the "aromatic" nature of the tropolone ring system is confirmed, and certain analogies to the phenols are indicated. 4 figures and 26 references. L.E.W.

ACID PLANT

BEIGHEY, L. C. H., and HOAR, F. J. Recent developments in acid making. Paper Mill News 73, no. 46: 94, 96, 98, 101 (Nov. 18, 1950); Pulp Paper Mag. Can. 51, no. 13: 99-102 (December, 1950).

Improvements and developments in the calcium bisulfite process are discussed under the following headings: sulfur melters, tubular melter, sulfur vaporizer (rotary and spray type), combustion chambers, burner-gas coolers (indirect coolers), spray cooler, limestone handling, temperature control, refrigeration, steam-jet refrigeration, recovery plant, chemical bases, and quality control of acid making. M.W.

AIR CONDITIONING

TURNBLACER, C. R. ±1% relative humidity control with Transaire temperature transmitters. Taylor Technol. 3, no. 2: 10-11 (Autumn, 1950).

A brief illustrated description is given of the air-conditioning system which the Ohio Boxboard Co., Rittman, Ohio, installed for maintaining the proper dry-bulb temperature and relative humidity in its laboratories during summer and winter. The closest control must be applied to the No. 1 laboratory, where paper products are tested and analyzed. Transaire temperature transmitters with Speed-Act action were selected for controlling the dry- and wet-bulb temperatures of the conditioned air; a portion of a circular chart is included which shows that the relative humidity is maintained within 1% of the value determined by the controller wet- and dry-bulb temperature settings. 4 figures. E.S.

AIR POLLUTION

KATZ, MORRIS, and COLE, R. J. Recovery of sulfur compounds from atmospheric contaminants. Ind. Eng. Chem. 42, no. 11: 2258-69 (November, 1950).

The emission of sulfur compounds, recognized as major atmospheric contaminants, must be reduced as a matter of economics and in the interest of public welfare. Great strides have been made in the control of smelter-smoke damage by scientific investigations of sulfur dioxide injury to plant life, and the application of remedial measures, which include the use of high stacks and high temperatures for the discharge of waste gases, the continuous automatic measurement of ground concentrations, the application of meteorological control by accurate forecasting of critical weather conditions, and the installation of recovery plants for the conversion of excess sulfur dioxide to liquid sulfur dioxide, sulfuric acid, fertilizers, or elemental sulfur. The annual losses of sulfur from products discharged to the atmosphere from zinc plants, lead, copper, and nickel smelters, crude oil refineries, and from coal combustion, are compared with world native sulfur production and by-product sulfur recovery. The extent to which sulfur emission must be reduced to avoid injury to plant life, is discussed in terms of the permissible levels of ground concentration. Methods for the recovery of sulfur compounds from sulfur dioxide and hydrogen sulfide in stack gas include the concentration of sulfur dioxide and its conversion to sulfuric acid, recovery as elemental sulfur, and flue-gas disposal of the effluent and noneffluent types. New developments of outstanding importance for purification and recovery of sulfur dioxide are embodied in the Trail ammonia process, the dimethylaniline process at Selby, and flash smelting at Copper Cliff in conjunction with liquid sulfur dioxide recovery. An aroused public consciousness of the need of controlling atmospheric pollution has stimulated investigations in many contaminated areas. Sulfur contaminants can be profitably recovered in many industrial operations, and thus the air can be cleaned and the rapidly depleting native sulfur reserves augmented. 5 tables, 6 figures, and 66 references. E.S.

BAGASSE

ANON. Paper from bagasse. World's Paper Trade Rev. 134, no. 13: 855-6, 858, 860, 862 (Oct. 5, 1950).

Fine paper has been successfully produced from bagasse for some time by the Cia. de Celulosa de Filipinas mill in the Philippines. Other mills which are preparing to use this raw material are mentioned. Although bagasse has been considered a waste product and has been burned under steam boilers by sugar factories in the wet state as received from the processing machines, new drying methods have been developed which will increase its calorific value and, in turn, the supply available for papermaking. The pulping process used for bagasse is the Celdecor-Pomilio continuous soda-chlorine process which is illustrated in a flow diagram. In addition to its use in making fine paper, bagasse, either alone or in combination with semichemical and kraft pulp, has been used in producing insulating and corrugating board and wrapping papers. 2 tables, 4 illustrations, and 1 flowsheet. M.W.

BARK

JENSEN, WALDEMAR. Studies of suberin. II. The suberin in cork of *Quercus suber*. Paper and Timber (Finland) 32, no. 10: 291-2 (October, 1950). [In English] *cf.* B.I.P.C. 21: 151.

Suberin in the cork of this oak contained the same fatty acids as those formed in the outer bark of birch. Methylation, separation, and purification of the acid mixture gave the dimethyl ester of an eicosanedicarboxylic acid, melting at 70.1-70.8°C., methyl phellonate, melting at 74.7-75.1°, and a methyl ester of a C_{18} monocarboxylic acid (with one double bond), melting at 38.1-39.0°. Details of the separation are given. 2 tables and 3 references. L.E.W.

JENSEN, WALDEMAR. Studies of suberin. III. Structure of phellonic acid. Paper and Timber (Finland) 32, no. 10: 293-4 (October, 1950). [In English]

Previous work on phellonic acid, $C_{22}H_{44}O_3$ (melting at 99.3-99.6°C.) is reviewed. Evidence to date (based on analysis, synthesis, and x-ray data) indicates that the compound is ω-hydroxybehenic acid (22-hydroxydocosanoic acid). The synthesis of its methyl ester (melting at 74.2-75.2°) is fully described. 2 tables and 17 references. L.E.W.

BLEACHING

ANON. A Gould Paper Company 'Solozone' bleach plant. Paper Mill News 73, no. 46: 68, 114-15 (Nov. 18, 1950).

A new peroxide bleaching plant for groundwood and sulfite is described, which is designed to operate at medium consistency (12-15% moisture-free basis). The plant has a capacity for bleaching 100 tons of groundwood, 130 tons of a groundwood-sulfite mixture, or 130 tons of sulfite pulp per day. Increases in brightness of 10-11 points Photovolt have been obtained with 2% sodium peroxide. Automatic equipment for the continuous preparation of the peroxide bleaching solution was used for the first time in this mill. The sequence of operations is outlined. 2 flowsheets and 5 illustrations. M.W.

HAGEN, JOHN F. Literature survey of textile bleaching. Am. Dyestuff Reptr. 39, no. 20: P663-6; no. 21: P703-14; no. 22: P739-50; no. 23: P782-6; no. 24: P820-30 (Oct. 2, 16, 30, Nov. 13, 27, 1950).

This literature survey covers the field under the subheadings: (1) continuous and semicontinuous bleaching—hypochlorite versus peroxide, and (2) bleaching—general considerations and miscellaneous processes, including chemicals used, processes and apparatus, the effects on the bleached material, chlorine, sodium chlorite, nascent hydrogen, ozonized air, chloramine, and the Mohr process. 719 references. M.W.

LAL, AMRIT. Bleaching of pulp. Indian Pulp and Paper 5, no. 2: 113-24 (August, 1950).

A detailed review is given of the various processes and agents used in bleaching pulp. 4 tables and 23 references. M.W.

LUNDBERG, A. HALVAR. Chlorine dioxide bleaching. Pulp & Paper 24, no. 12: 94, 96 (November, 1950); *cf.* B.I.P.C. 20: 710. [Note previous reference should be to Pulp & Paper and not to Pulp Paper Mag. Can.]

The author discusses the development, advantages, and limitations of bleaching with chlorine dioxide. The discovery that the main part of the incrusting substances can be removed with cheaper chemicals, such as chlorine and hypochlorite, with or without alkali extraction, and the residual material be bleached to full whiteness with chlorine dioxide without any further change in its physical properties, has made the process feasible from an economic viewpoint. Some of the many patented and proposed processes and the reactions involved in the manufacture of chlorine dioxide are outlined briefly. It has been shown that chlorine dioxide containing chlorine (even to the extent of equal molecular proportions) may be used without disadvantage, especially in bleaching sulfate pulps. Examples of bleaching

procedures for sulfate and strong sulfite pulps are given. On account of the blocking effect which occurs when bleaching in acid solution, the lignin must be removed by chlorine dioxide treatments divided into steps by alkaline washings and not in one single step, after as much as possible of the incrusting material has first been removed with the less expensive chlorine and hypochlorite. Thus far the widest application of chlorine dioxide as a bleaching agent has been made in the production of bleached sulfate pulp. 2 tables. E.S.

SIHTOLA, HANNES, and GUSTAFSSON, G. RURIK. On the oxidation of sulphite pulp during afterbleaching. Paper and Timber (Finland) 32, no. 10: 295-305 (October, 1950). [In English]

Details are given of a study of the oxidation of a rayon (sulfite) pulp in a final bleaching step. The pulp had received a preliminary bleach in which two chlorinations and neutralizations were used, but details of which are not included. The starting material had a TAPPI permanganate number of 1.8, a Wilson carboxyl content (*cf.* B.I.P.C. 18: 508-9) of 1.65 milliequivalents per 100 g., copper number of 2.1, cupriethylenediamine viscosity in 1% solution of 97.5 centipoises, 89.5% α-cellulose, and 58.3% (G.E.) brightness. In the final bleach, at 5% pulp consistency, chlorine dosages (using chlorine water to which sodium hydroxide had been added, or sodium hypochlorite solutions to which hydrochloric acid had been added) were 0.72, 0.9 and 1.08% of the pulp weight at temperatures of 30, 40, and 50°C. and at pH's of 2, 4, 6, 8, 10, and 12. The reaction time was so chosen as to allow the chlorine to be consumed almost completely. Oxidation was followed primarily by means of carboxyl and copper-number determinations. Viscosity, brightness, α-content, pentosans, and ash content were also determined on the final samples. Details are given in numerous graphs and in an extensive table. The results (for which the original article must be consulted) are in general agreement with those of other investigators in this field. However, some differences in interpretation exist, e.g., in general the reaction rate decreases with rising pH. This is true within the pH range of 2-10. At a pH of 12, the rate of the start of the reaction is actually slower than at pH 10. However, as the reaction proceeds, the rate at pH 12 increases, finally to such an extent that the total reaction time at pH 12 is shorter than at pH 10. 1 table, 28 graphs, and 22 references. L.E.W.

BOARD

CAUGHEY, ROBERT A. Synthetic boards from wood waste. Chemurgic Digest 9, no. 11: 9 (November, 1950). [Abridgment] *cf.* B.I.P.C. 20: 471.

The author describes the use of sawdust and shavings in the manufacture of synthetic board materials, the physical properties of the resulting products, and possible applications, with particular reference to the board used as an underlay for linoleum, asphalt, or rubber tile. E.S.

HADLEY, HARRY E. How 'variables' affect boxboard manufacture. Boxboard Containers 68, no. 695: 47-8 (November, 1950); Fibre Containers 35, no. 12: 144, 146, 148, 150, 152, 154-6 (December, 1950).

The author discusses some of the variables which affect the manufacture of folding boxboard, including process water, cylinder diameter, felts, raw stocks and stock treatment, atmospheric changes, water temperature, pH, color affinity, density and crown of rubber rolls, and the human element. M.W.

KOLLMANN, FRANZ. Factors which influence the quality in the manufacture of wallboards from wood fibers and wood waste.

Svensk Papperstidn. 53, no. 19: 591-604 (Oct. 15, 1950). [In German; English summary]

The author gives a detailed description of the manufacture of hardboards, including raw materials, their processing, adhesives and impregnating agents, molding and pressing, conditioning, and finishing. Although he deals principally with central European practices, reference is also made to Scandinavian and American techniques. 1 table, 18 figures, and 28 references. E.S.

BOARD, CORRUGATED

DE PAPIERWERELD. Corrugated board. Papierwereld. Documentaire Monografie no. 1: 1-12 (August, 1949). [In Dutch]

The monograph contains the following articles, listed by authors and titles: Nestelroij, H. J. The development of the corrugated board industry, p. 1-2; Engbers, H. J. How is corrugated board made?—5 figures, p. 3-5; van Hal, A. M. C. The Dutch corrugated board industry—1 map, p. 6-7, 10; Proefstation voor Verpakkingen T.N.O. The testing of corrugated board—3 illustrations, p. 8-10. A list of the Dutch corrugated board manufacturers (p. 11) and a bibliography with 14 references (p. 12) are appended. E.S.

BOARD MILLS

ANON. Fibreboard Products builds wood pulp and board mill. Crane Valve World 47, no. 3: 86-9 (1950); *cf.* B.I.P.C. 20: 778-9.

A brief outline of the processes used in the semichemical kraft and bleached kraft mills is given. Illustrations are included which depict valves, piping, and pumps installed by Crane. 7 figures. E.S.

PORTER, RICHARD W. Gaylord completes postwar expansion. Paper Ind. 32, no. 8: 850-9 (November, 1950).

An illustrated description of the postwar expansion program of Gaylord Container Corp., Bogalusa, La. is given. Built originally to produce about 100 tons of cylinder linerboard per day, the mill has multiplied its production capacity to the extent that it now turns out over 850 tons of kraft and semichemical paper and paperboard per day. A complete new wood-handling and preparation system has been added, which includes a flume-type conveyor, a wood-unloading crane, a barking drum and chipper, and screens and conveyors. Four new digesters, brown stock washers, three additional Swenson evaporator units, one recovery furnace, and three Dorr causticizing tanks have been installed in the pulp mill, and two new Impco rotary knot screens and two Bird centrifugal screens have been added to the wet room. Four high-density steel storage tanks with auxiliary conveyors provide a total storage capacity of about 800 tons of pulp. The semichemical pulping systems involves the cooking of oak chips in four old digesters and refining in Sprout-Waldron disk refiners, divided into two batteries. The five primary refiners are new machines. In conclusion, reference is made to the rebuilding of the No. 4 paper machine, including a new calender and rewinder, and to the installation of a new gas-fired boiler and a Westinghouse turbogenerator. 36 illustrations. E.S.

PULP & PAPER. A paperboard leader; original engineering at Alton Box Board "Fumididdle" just one of unique features. Pulp & Paper 24, no. 12: 38, 40, 42, 44, 46, 101 (November, 1950); *cf.* B.I.P.C. 18: 300-1.

Several outstanding features in the board mill of the Alton Box Board

Co., with a daily capacity of about 700 tons of boxboard, are discussed, including the special refining, piping, and pumping arrangement (named "Fumididdle") which serves the new No. 4 machine; the Beloit cylinder machine No. 4, called the Altonian; a new system of handling and cooking straw; a new Waldron Microjet coater; improvements in the boiler plant; and storage and fire-protection facilities. The article is profusely illustrated. E.S.

PULP AND PAPER MAGAZINE OF CANADA. New developments at Anglo-Canadian. Pulp Paper Mag. Can. 51, no. 11: 74-89 (October, 1950).

A detailed description of the new board mill and steam generating unit at the newsprint mill of Anglo-Canadian Pulp and Paper Mills, Ltd., Limoilou, Que. is given. The new board machine is a six-cylinder unit which uses groundwood and sulfite screenings from the newsprint operation, several grades of waste papers, and high-class pulps for a wide range of paperboards. The stock-preparation equipment includes Jones No. 1 refiners, Hydrapulpers, Hydracycle tanks, Hydrafiners, and jordans. The machine is driven by a mechanical drive from the variable-speed lineshaft in the basement; the driving unit is a single-stage, noncondensing steam turbine. The new boiler is a VUX unit built by Combustion Engineering Corp. and arranged for tangential firing with pulverized coal, the first in the industry to employ this method. 16 illustrations and 1 flowsheet. E.S.

CELLULOSE—HEAT OF WETTING

WAHBA, MAURICE. Moisture relationships of cellulose. II. The heats of wetting of partially saturated viscose rayon and standard cellulose in water. J. Phys. & Colloid Chem. 54, no. 8: 1148-60 (November, 1950); *cf.* B.I.P.C. 19: 149.

The heats of wetting of partially saturated samples of standard cellulose and viscose rayon (regenerated cellulose) in water at 30°C. were determined in the absence of air. The adsorption isotherms at 30° of water vapor on these two adsorbents were also determined. The measurements on viscose rayon and on standard cellulose were compared at the same relative humidities $P/P°$ (ratio of water-vapor pressure to saturation water-vapor pressure). It is shown that the ratios of their values of adsorption, heats of wetting, and heats of adsorption are not constant. They vary with $P/P°$ in correspondence with each other in a way that suggests that the adsorbing area in viscose rayon is nearly twice that in standard cellulose, but the intermicellar spaces in the rayon are narrower, allowing a smaller number of adsorbed layers. Adsorption is accompanied by an increase in entropy in the very early stages, suggesting a two-dimensional motion of the adsorbed molecules. The entropy decreases as the adsorbate concentration increases, showing a maximum decrease when $P/P°$ equals about 0.06. This probably occurs when the formation of a second adsorbed layer begins to show its effect, while the first layer is not yet complete. The entropy change decreases with the thickening of the adsorbed film, but it reaches zero only at saturation, suggesting that the film may be still different from the ordinary liquid even near saturation. 2 tables, 7 figures, and 16 references. E.S.

CELLULOSE—HEMICELLULOSE

SITCH, D. A., and MARSHALL, H. BORDEN. The effect of hemicelluloses on the papermaking properties of white birch. Can. J. Research 28 F, no. 10: 376-89 (October, 1950).

A fibrous holocellulose was isolated from white birch using hot, acidified sodium chlorite solutions. Pulps of varying hemicellulose content were prepared by alkaline treatment, and their beating and sheetmaking properties compared with the original holocellulose. Tensile strength increased with hemicellulose content, whereas tearing resistance and fold endurance decreased. Bursting strength reached a maximum at about 15% alkali-extractable hemicellulose content. Pulps obtained in yields of 46-53%, i.e., containing 10-20% hemicellulose, possessed the best over-all strength. A bleached sulfite pulp prepared from the same chips in a yield of 43.6% contained 20.7% alkali-extractable hemicellulose. The over-all yield of α-cellulose was about 6% lower (based on the wood) than in the case of the holocellulose, thus indicating greater fiber damage during the sulfite process. Handsheets made from the sulfite pulp were inferior to sheets made from a chlorite pulp of the same hemicellulose content in bursting and tensile strengths but had better tearing and fold properties. The presence of hemicellulose was found to increase the rate at which the average fiber length was reduced during beating, thus indicating a correlation between fiber flexibility and hemicellulose content. Since pulps of high strength were prepared, it was concluded that greater quantities of white birch pulp at the appropriate hemicellulose content could be incorporated in many commercial furnishes. 9 tables, 4 figures, and 29 references. E.S.

CELLULOSE—OXYCELLULOSE

HASKINS, J. F., and HOGSED, M. J. The alkaline oxidation of cellulose. I. Mechanism of the degradative oxidation of cellulose by hydrogen peroxide in presence of alkali. J. Org. Chem. 15, no. 6: 1264-74 (November, 1950).

An investigation was carried out for the purpose of clarifying the mechanism of the alkaline oxidation of cellulose. The oxidizing agent used was hydrogen peroxide in the presence of 3.4 *N* sodium hydroxide, and the reaction was carried out at room temperature, thus simulating conditions under which cellulose is aged in the manufacture of viscose. One of the products identified was D-arabonic acid in the form of the tetraacetate. Since glycosido-arabonic acids are obtained by the oxidation of glycosidoglucoses with hydrogen peroxide, it may be assumed that the arabonic acid found is a measure of the number of reducing end groups formed by the oxidative splitting of the cellulose chains, although it is not a quantitative measure. The aldol dehydration mechanism, which requires an increase in the number of reducing end groups, is consistent with the experimental results of this investigation. Oxidation of any of the hydroxyl groups will produce a product which can readily undergo aldol dehydration. 23 references. M.W.

HASKINS, J. F., and HOGSED, M. J. The alkaline oxidation of cellulose. II. Chromatography of acetylated carbohydrate acids. J. Org. Chem. 15, no. 6: 1275-7 (November, 1950).

A chromatographic method for the separation of acetylated carbohydrate acids and derivatives has been developed. Silicic acid mixed with Celite was used for the columns, and a benzene solution of acetic acid as the developer. The descending order of adsorption of the various acetylated carbohydrate derivatives has been determined to be: amides, phenylhydrazides, acids, lactones, and nitriles. 1 table and 12 references. M.W.

CELLULOSE ETHERS

DÜRIG, G., and BANDERET, A. The structure of aqueous solu-

tions of carboxymethylcellulose. Helv. Chim. Acta 33, no. 4: 1106-18 (June 15, 1950). [In French]

The different rheological behavior of two carboxymethylcelluloses (which possess almost the same molecular characteristics) is explained by the fact that they contain very different proportions of a fraction which is insoluble but swells strongly in water. This fraction is partly crystallized and still retains to some degree the plant structure of the original cellulose. Hence, the micellar structure characterizes the carboxymethylcelluloses rather than their molecular size. In solutions of these compounds there exists a double association of molecules, one of which is amorphous and forms spontaneously as a result of the presence of ionized groups; the other is crystalline and stable, but not of spontaneous formation. 11 tables, 6 figures, and 39 references. E.S.

TIMELL, TORE. Cellulose reactions. XIV. The distribution of the substituents in a technical, water-soluble methylcellulose. Svensk Kem. Tid. 62, no. 5: 129-33 (1950). [In English] *cf.* B.I.P.C. 20: 782.

The distribution of the substituents in Methocel, a methylcellulose of the high-viscosity type with a degree of substitution of 1.93, was determined. The ratio of reactivity of the different hydroxyl groups, $k_2:k_3:k_6$, in this case was 1.56:1:1.09. The decrease in reactivity of the primary hydroxyl may be explained by the higher acidity of the 2-hydroxyl group which is bound directly to the pyranose ring, a property which is more important, the stronger the alkali used. The distribution of substituents is on the whole the same as noted previously for similar ethers. The experimental data are summarized in a series of tables. This is the concluding article of the series. 9 tables and 5 references. M.W.

CHIPS

MURTO, JAAKKO O., and PEROLAHTI, ONNI. Chipping of pulpwood. V. Classifying of pulpwood chips. Paper and Timber (Finland) 32, no. 10: 309-17 (October, 1950). [In Finnish; English summary] *cf.* B.I.P.C. 20: 310-11.

The authors discuss the purpose of the screen analysis of chips; a schematic drawing illustrates the various dimensions of the chip. The TAPPI Tentative Standard T 16 m-47 is outlined with particular reference to the effect of the size of the holes in the lowest plate on the amount and appearance of the fine fraction. The results of American screen analyses are discussed and represented graphically. In the Central Laboratory in Finland a series of preliminary tests with a Williams chip classifier has been carried out. A considerable portion of the raw material used by Finnish sulfate mills consists of wood waste purchased from sawmills in the form of chips. As a basis for pricing, the screen analysis of chips is of vital importance. The screening operations of two different mill installations have been investigated. The results showed that the pneumatic conveying of chips (which is still used in Scandinavian mills) causes them to split. Experiments carried out in the sulfate mill at Valkeakoski have shown that wide-spout, single-knife chippers produce more small chips from frozen than from unfrozen wood. Corresponding experiments with a multiknife chipper will be carried out at a later date. 9 figures and 8 references. E.S.

CHROMATOGRAPHY

WYNN, VICTOR. A peptide-like contaminant of filter paper. Nature 164, no. 4167: 445 (Sept. 10, 1949).

The hydrolysis of the residues obtained by the evaporation of the distilled water used to develop a chromatogram of amino acids from urine with ninhydrin and Whatman filter papers No. 1, 2, and 4 for 48 hours indicated the presence of peptidelike contaminants in the filter paper as supplied by the manufacturer; these ninhydrin-reacting substances, as well as other salts, cause considerable distortion of the chromatograms. The specimens obtained after longer periods (3-5 days) yielded no interfering substances. These observations indicate that washed filter paper should be employed if the isolation of substances by the cutting-out procedure of chromatography is used. Washed filter paper also has certain other advantages. Interfering background colors and distortion of the lower part of the two-dimensional chromatogram of urine (found consistently with unwashed paper) are much reduced. Similarly, interfering background effects are significantly reduced in sugar chromatography by the Partridge method. Whatman No. 1 paper is 25% faster after washing, whereas the speed of No. 4 is unchanged. 3 references. E.S.

WYNN, V., and ROGERS, G. Observations on the behaviour of protein in paper partition chromatography. Australian J. Sci. Research 3 B, no. 1: 124-31 + 2 plates (February, 1950).

A study has been made of the behavior in partition chromatography on filter paper, by the method of Consden, Gordon, and Martin (*cf.* B.I.P.C. 15: 136), of several proteins commonly occurring in biological fluids. It is shown that the protein in such fluids may appear as a ninhydrin-reacting spot in a characteristic position on the chromatogram and present a problem in identification. The proteins tested have an R_F value in phenol of 1, and in collidine of 0. After their movement in phenol, their subsequent elutability in distilled water and in phenol is affected by such factors as the method employed for removing the phenol, and the use of filter paper as supplied, or with the contaminating substances present in the filter paper removed by prior washing with water. It has been found that amino acids and peptides are not split from proteins during their movement in phenol, and that the area of the ninhydrin-reacting spot given by the protein after a phenol chromatogram is approximately proportional to the concentration of the protein in the test sample. 2 tables, 3 figures, and 12 references. E.S.

COLOR

ANON. How C C of A uses color. Boxboard Containers 68, no. 695: 12-13, 15 (November, 1950).

In choosing interior color schemes at Container Corporation of America, factors which received consideration included floor layouts, the lighting system, various contrast levels, and the effect of colors on employees. This program of color planning led to the publication of the "Color Harmony Manual," a practical system of color standards suitable for general industrial usage. 3 illustrations. M.W.

COLORIMETRY

ANON. Colour and opacity measurement. Brit. Printer 63, no. 375: 58-9 (November-December, 1950); World's Paper Trade Rev. 134, no. 12: 809-10 (Sept. 28, 1950).

A review is given of PATRA's new devices and service in the measurement of color and opacity of printing papers and inks. With the exception of the Hilger Uvispeck spectrophotometer, all instruments mentioned were devised by PATRA. 2 illustrations in the first reference. M.W.

COMPRESSION WOOD

WARDROP, A. B., and DADSWELL, H. E. The nature of reaction wood. II. The cell wall organization of compression wood tracheids. Australian J. Sci. Research 3 B, no. 1: 1-13 + 2 plates (February, 1950); *cf.* B.I.P.C. 21: 10.

Optical and x-ray methods have been used in the examination of the secondary cell wall of compression wood tracheids from a number of species of gymnosperms. By these methods it has been shown that the cell wall of compression wood tracheids consists of two layers. In the outer layer the micelles are inclined at a wide angle to the longitudinal axis of the tracheid, whereas in the inner layer the micelles are inclined at a relatively acute angle. In the inner of the two layers there exist radial discontinuities in the spiral micellar structure, which are visible as longitudinal striations in the cell wall. These discontinuities also account for the radial distribution of lignin which is observed in transverse sections of compression wood tracheids. By determining the average tracheid length of the last-formed summerwood in the various growth rings of several eccentric stems of *Pinus radiata* D. Don, it has been shown that the tracheids of compression wood are appreciably shorter than would be the case if no compression wood were present. A study of the change in micellar orientation with change in tracheid length has indicated that the angle of micellar orientation in compression wood tracheids does not differ significantly from that existing in normal wood tracheids of similar length. In so far as the properties of wood are determined by cell wall organization, it is concluded that comparisons between compression wood and normal wood should be made on material of the same tracheid length and spiral organization. It is suggested that both the reduction in tracheid length and eccentric radial growth in stems containing compression wood are to be attributed to an increase in the number of both transverse and tangential longitudinal divisions of the fusiform initials of the cambium. 2 tables, 16 figures, and 25 references. E.S.

CONTAINER INDUSTRY

ANON. Use of paperboard containers doubled since 1939. Can. Pulp Paper Ind. 3, no. 11: 10-11, 30 (November, 1950).

The annual production in Canada of paperboard and composite containers is about twice that of 1939. The large output is due in part to increased demands for paperboard cans for such products as salt, cleansers, drugs, etc. Different types of cans for various products and their methods of manufacture are described. 5 illustrations. M.W.

CONTAINER INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. Legal problems faced by board and box companies. Fibre Containers 35, no. 11: 92-6 (November, 1950); *cf.* B.I.P.C. 21: 85.

Legal opinions are given with regard to the following questions and with reference to outstanding higher court decisions: government plant appropriation; state laws which exempt ordinary manufacturing plants from taxation; the "carry-back" provision of the Revenue Code; payment and acceptance conditions for orders which are sent in error; unfair competition; contracts; and restrictive contracts. M.W.

COTTON

HEYN, A. N. J. Letters to the editor. The relationship of wax content to maturity of cotton. Textile Research J. 20, no. 11: 771-2 (November, 1950); *cf.* B.I.P.C. 20: 711-12.

A brief discussion is given of some minor points brought out in the letter by Marsh, Barker, Kerr, and Butler. 3 references. M.W.

DIGESTERS—FILLING DEVICES

MORSETH, GORDON, and HANER, VICTOR. Filling digesters from overhead chip bins. Paper Ind. 32, no. 8: 860-1 (November, 1950).

The construction, operation, and advantages of a rotating steam nozzle for the effective removal of chips from an overhead chip bin are described. 1 diagram. E.S.

DYES AND DYEING

LIPS, H. A. Shade and quality control in the dyeing of paper. Tappi 33, no. 11: 106-8A (November, 1950).

The author discusses the influence of the furnish, filler content, dyestuff selection, pH, sizing, order of beater addition, degree of stock preparation, and paper machine variables (particularly the suction, drying conditions, and calenders) on the matching of specific paper shades. The importance of selecting a standard light source for judging shades is also pointed out. 2 tables. E.S.

EDUCATION

ANON. Technical education in India. Indian Pulp and Paper 5, no. 2: 127-30 (August, 1950).

The present facilities in India for technical education are reviewed. In order to provide for training and research in technical subjects, four institutes will be established by the Government. A description is given of the Indian Institute of Science at Bangalore which has been in existence for many years, and its program for development is summarized. The need for the co-operation of industry in providing practical training and the desirability of standardization of academic policies is stated. A government program is in effect for the training of Indian scientists and technical personnel abroad. M.W.

ENZYMES

KRISTIANSSON, INGRID. Investigations on cellulases in malt and fungi. Svensk Kem. Tid. 62, no. 5: 133-5 (1950). [In English]

A preliminary report on activity investigations of cellulases in malt and fungi is given, using hydroxyethylcellulose ether as the substrate. The optimum activity of malt cellulase was found to be at pH 4, the optimum stability at about pH 5.0-5.5, and the isoelectric point at about pH 5. It was also found that calcium salts have no influence upon the stability of malt cellulase, and that the cellulase activity of green malt was twice that of dried malt, calculated on a dry-weight basis. The cellulase in *Lentinus lepideus* had its optimum activity at pH 4. 2 figures and 3 references. M.W.

TRACEY, M. V. Cellulase from leaves and roots of tobacco. Biochem. J. 47, no. 4: 431-3 (October, 1950).

An enzyme that can depolymerize sodium carboxymethylcellulose and split reprecipitated cellulose has been found in tobacco plants; its optimum pH range is between 5 and 6. These properties are similar to those of animal and fungal cellulases, such as *Helix* digestive juice and many molds. The tobacco enzyme is present in very low concentrations. It is suggested that this may be explained by its localization in cells in which reconstruction of the thin primary cell wall occurs as a concomitant of cell growth. 8 references. M.W.

FIBER—DIMENSIONS

ADAMSON, J. E. Application of the Kozeny equation to consolidated porous media. Nature 166, no. 4216: 314-15 (Aug. 19, 1950).

Preliminary remarks, complementary to those of Wyllie and Rose, are made; the communication is based on experiments on the electrokinetic properties of the interface between the wool fiber and water (see abstract below). 2 references. E.S.

CARMAN, P. C. Some physical aspects of water flow in porous media. Discussions Faraday Soc. no. 3: 72-7 (1948).

The author deals exclusively with viscous flow in this paper. Poiseuille's law is not a reliable measure of the actual size of capillary space, since a porous medium is not equivalent to a bundle of circular capillaries. However, the Kozeny-Carman law holds well, and the only rational pore diameter calculable from permeability measurements is $d = 4 \times$ (hydraulic radius). The limitations of Kozeny's law are discussed. Its application is extended to both density and diameter of cellulose fibers in paper pulps. Pore diameters as normally calculated by the bubble-pressure method are equal to $4 \times$ (hydraulic radius) and should equal those calculated from permeability. The method, however, is open to considerable uncertainty and error. 25 references. E.S.

WYLLIE, M. R. J., and ROSE, WALTER D. Application of the Kozeny equation to consolidated porous media. Nature 165, no. 4207: 972 (June 17, 1950).

Attention is drawn to the fact that the numerical constant k in the Kozeny equation may exceed 5, if a tortuosity correction based on the electrical resistance of the system is applied. 2 tables and 6 references. E.S.

FIBER—IDENTIFICATION

PRESTON, J. M. Identification of fibres. J. Textile Inst. 41, no. 9: P679-91 (September, 1950).

A description is given of the different tests which may be applied to natural and synthetic fibers on the basis of effects of heat, density, swelling and solubility, molecular patterns, color reactions, and morphology. 7 tables, 1 figure, and 34 references. M.W.

FIBER—TESTING

HESSLER, LYLE R., and KIEKE, HERBERT E. A mechanized fiber blender. Textile Research J. 20, no. 11: 802-4 (November, 1950).

The construction and operation of a mechanized fiber blender for cotton developed at Texas Technological College are described. The results of tests obtained with five different methods, including the fiber blender, showed that it yielded the samples with the highest strength and the lowest standard deviation. No change in fiber length was found to take place after a long period of randomization, which provides evidence that the cotton is not injured during treatment. 1 table, 2 figures, and 2 references. M.W.

FINISHING ROOM

IMMONEN, BJÖRN. The finishing room as a basis of quality control. Norsk Skogind. 4, no. 9: 248-56, 258-61 (September, 1950). [In Swedish; English summary]

Following a brief description of the significance of the finishing department of a paper mill, the different hand-sorting methods and the nature and occurrence of paper defects are outlined. Recommendations for the reduction or simplification of the work are made, including descriptions of different mechanized sorting tables and machines. The author suggests that the work of the finishing room be employed for control purposes and shows how the results obtained in the systematic recording of defects may be used by management for the installation of a system of statistical quality control of the mill's output. The application of these principles to different degrees of accuracy in sorting is discussed. Specimens of control charts and reports are included. 7 tables, 17 figures, and 40 references. E.S.

FOAM

BURCIK, EMIL J. The rate of surface tension lowering and its role in foaming. J. Colloid Sci. 5, no. 5: 421-36 (October, 1950).

The rate of surface-tension lowering of solutions of sodium laurate, sodium dodecyl sulfate, and sodium oleate was determined by the oscillating-jet technique. The stabilities of foams containing these surface-active agents were measured by the single-bubble technique. The surface viscosity and surface plasticity were determined for sodium laurate solutions. No plasticity was observed, and the viscosity was essentially that of pure water. The rate of surface tension lowering of sodium laurate increases with increasing concentration. At a given concentration the rate of lowering for sodium dodecyl sulfate is appreciably greater than that for sodium laurate. In the higher concentration range the rate for sodium oleate does not increase appreciably. Sodium chloride increases the rate of surface-tension lowering of sodium laurate. It is probable that the stability of a foam is the result of the ability of its films to resist deformation. The conditions for high foam stability are: (1) low surface tension relative to that of the pure solvent, (2) moderate rate of surface-tension lowering, and (3) a high bulk or surface viscosity. The foam stabilities determined in this research are in qualitative agreement with theory. 10 figures and 20 references. E.S.

FORESTS AND FORESTRY

HILF, H. H. Problems of log utilization in Germany. Svensk Papperstidn. 53, no. 19: 605-8 (Oct. 15, 1950). [In German; English summary]

The author discusses the problems arising from the present unbalanced forestry conditions in Germany. E.S.

ISENBERG, IRVING H. Pulpwood plantation in miniature. Paper Ind. 32, no. 8: 866 (November, 1950); *cf.* B.I.P.C. 15: 407.

Additional data are given on the survival and growth of a small pulpwood plantation which is located in a ravine behind the main building of The Institute of Paper Chemistry. After ten years in plantation (total age, 13 years), the survival is 70%, the average height is 8 feet, and the tallest tree is 25 feet. Some species (white spruce and Norway spruce) have much better survival rates than others; balsam fir and red pine gave the poorest results. 3 tables and 1 illustration. E.S.

PEPLER, W. A. E. The economics of applied silviculture. Pulp Paper Mag. Can. 51, no. 11: 127-8 (October, 1950).

Speaking principally for Canada, where the stage of exploiting virgin forests has not yet been quite passed and where little demand for the

knowledge of growing wood has existed so far, the author emphasizes the need for establishing definite goals in silviculture and silvicultural research. Foresters should strive to acquire the knowledge which will be most marketable in economic terms of early profits and highest dividends. E.S.

STAMM, E. P. Forestry in the U. S. Pacific Northwest. Pulp Paper Mag. Can. 51, no. 11: 143-4, 146, 148, 150 (October, 1950).

The author discusses the activities with regard to reforestation, cutting methods, management plans and administration, Oregon and Washington State Conservation Acts, selective cutting, research activities, fire protection, conservation education, and progress through the joint effort of associations. E.S.

TINNEY, W. A. Rapid regeneration in West. Pulp & Paper 24, no. 12: 80, 82 (November, 1950).

The author emphasizes the need for more accurate yardsticks of knowledge for measuring the restocking requirements of given areas of cutover lands. It is generally agreed among field foresters that artificial planting or seeding should be used only as a last resort. Data from reproduction surveys at the Neah Bay Tree Farm of Crown Zellerbach on burned-over and logged areas are given, which indicate that nature can do most of the restocking job quite quickly and very cheaply in the Douglas-fir and hemlock regions of the West Coast, if a wise selection of seed blocks or strips has been made and adequate fire protection is provided. 1 illustration. E.S.

GUAR

WHISTLER, ROY L., EOFF, W. H., and DOTY, D. M. Enzymatic hydrolysis of guaran. J. Am. Chem. Soc. 72, no. 11: 4938-9 (November, 1950).

An enzyme preparation separated from germinated guar seeds has been found to cause a guaran solution to undergo both a rapid decrease in the viscosity and a rapid increase in reducing power. As characterized by its ability to increase the reducing power of a guaran solution, the enzyme preparation shows greatest activity at pH 5 in a citric acid-disodium phosphate buffer and at pH 4.4 in an acetic acid-sodium acetate buffer. The effect of temperature on the enzyme action is also examined. It is likely that more than one enzyme is present. Although malt diastase causes a decrease in viscosity of a guaran solution, the results suggest that the active enzyme is neither α- nor β-amylase but an enzyme impurity similar in properties to β-amylase. 14 footnotes. E.S.

HISTORY

AMERICAN PRESSMAN. The paper maker's contribution. Am. Pressman 60, no. 3: 106, 108 (February, 1950); *cf.* B.I.P.C. 18: 593.

To illustrate the contribution of the papermaker to the progress of printing, the history of the Kimberly-Clark Corporation is traced. A chronological outline of the growth of Kimberly-Clark from 1872 to 1947 is included. M.W.

VOORN, H. The invention of paper. Papierwereld. Documentaire Monografie no. 3: 3-14 (March, 1950). [In Dutch]

The invention of paper by Ts'ai Lun is described, and Chinese and Japanese papermaking is outlined. 10 illustrations and 15 references. E.S.

ILLUMINATION

LINDSAY, E. A. Light and paper. Tappi 33, no. 11: 95-100A; discussion: 100-1A (November, 1950).

The author discusses the requisites of good lighting in the manufacturing areas of the paper industry, laboratories, shipping rooms and warehouses, stock and tool rooms, and office areas. Reference is made to the importance of a definitely planned maintenance program and the reduction of hazards in a well-lighted environment. E.S.

INSTRUMENTATION

BROWN, R. M. These instruments put know-how into chemical-recovery unit's operation. Power 94, no. 7: 122-5 (July, 1950).

An outline is given of the many instruments which are employed in a modern black liquor recovery furnace with steam boiler. 2 illustrations and 1 flowsheet. E.S.

LIGNIN

ERDTMAN, HOLGER, and PETTERSSON, TAGE. Studies on the sulphonation of lignin. II. Sulphonation of ethoxylated lignin sulphonic acids of low sulphur content. Acta Chem. Scand. 4, no. 7: 971-7 (1950). [In English] *cf.* B.I.P.C. 20: 790-1.

Low-sulfonated, ethoxylated lignosulfonic acids have been obtained from sulfonated wood containing free sulfonic acid groups by refluxing with ethanol. These acids have been subjected to resulfonation with sulfite cooking acid of varying acidity. When the acidity is low, no elimination of ethoxyl groups takes place. However, at high acidity the ethoxyl groups are split off and are apparently more or less completely replaced by sulfonic acid groups. This constitutes new evidence of the presence of different groups in lignin which are characterized by varying reactivity to sulfite. 2 tables and 11 references. E.S.

FREUDENBERG, KARL, and BITTNER, FRIEDRICH. Coniferyl alcohol from Siam benzoin gum. Chem. Ber. 83, no. 6: 600-4 (October, 1950). [In German]

Monobenzoyl coniferyl alcohol (I), which occurs in Siam benzoin gum (II), is not saponified without polymerization. To obtain coniferyl alcohol (III), (I), which is isolated from (II) by extraction with ether, is treated in pyridine with *p*-toluenesulfonyl chloride to yield 90% *p*-tosylconiferyl benzoate (IV). Partial saponification of (IV) with sodium methoxide in methyl alcohol at 0°C. gives tosylconiferyl alcohol. Saponification of 30 grams of (IV) with sodium methoxide in methyl alcohol for 12 hours at 0° and then with 30% potassium hydroxide for 24 hours at 20° gives 49% crystalline (III). (III) is coupled with acetobromoglucose, and the reaction product is saponified to give coniferin. When (I) is treated with 1 *N* sodium hydroxide at 0° for only 25 seconds, a polymerization product consisting of 2 moles (III) and 1.23 moles (I) is obtained. 3 figures and 9 references. F.E.B.

FREUDENBERG, KARL, and HEIMBERGER, WERNER. The biochemical synthesis of ligninlike products. Chem. Ber. 83, no. 6: 519-30 (October, 1950). [In German]

Coniferyl alcohol (I), when subjected to the action of phenol dehydrogenases, gives a dehydrogenation polymerization product (DHP) which is identical with, or very similar to spruce lignin. When 20 grams of coniferin

are hydrolyzed with 2 grams of emulsin (Merck) at a pH of 7 under exclusion of air for eight days at 35°C., and the pH of the mixture is readjusted with phosphate buffer to 7 after the addition of 2 grams of dry ferment or 100 ml. of press juice of *Psalliota campestris* and oxygen passed into the mixture for three days, 93% of (I) is converted into DHP with 66.67% carbon, 5.95% hydrogen, and 16.8% methoxyl. DHP is soluble in bisulfite, giving ammonium DHP-sulfonate with 54.6% carbon, 5.58% hydrogen, 3.65% nitrogen, 6.62% sulfur, and 13.65% methoxyl. Ammonium lignosulfonates prepared under the same conditions from sprucewood and from coniferin have similar compositions. Extraction of sprucewood with 80% acetone for three days at 95° gives 2.6% (based on the wood) or 8.66% (based on the lignin content of the wood) acetone lignin (II) with 65.5% carbon, 5.82% hydrogen, and 16.01% methoxyl. DHP and (II) when refluxed with 1% sulfuric acid give products with somewhat higher carbon and methoxyl contents. DHP has a molecular weight of 810-820 as determined by isothermic distillation. It takes up 0.5 mole of hydrogen per methoxyl group in the presence of Raney nickel. DHP gives the color reactions of lignin, is optically inactive, and gives 95.5% Klason lignin. On distillation with 34% sulfuric acid, DHP gives 1.6-1.7% formaldehyde. When methylated, heated with alkali, methylated again, and oxidized with potassium permanganate, DHP gives 4.0% isohemipinic and 2.1% dehydrodiveratric acids. DHP reacts with thioglycolic acid to give a thioglycolic acid DHP of a composition very similar to that of thioglycolic acid spruce lignin. DHP contains 14.2% total hydroxyl groups, of which 1.8% are phenolic. The ultraviolet absorption curves of the ammonium sulfonates from sprucewood and from DHP are identical. 3-Methoxy-4-hydroxy-1-(2,3-dihydroxypropyl)-benzene has been synthesized and exposed to the action of oxygen at pH 7 in the presence of mushroom ferment, giving a polymerization product with 60.46% carbon, 5.32% hydrogen, and 15.61% methoxyl. Under the same conditions coniferyl aldehyde gives 62.5% of a polymerization product with 67.4% carbon, 4.98% hydrogen, and 17.78% methoxyl. 5 tables, 1 figure, and 24 footnotes. F.E.B.

FREUDENBERG, KARL, and KRAFT, RICHARD. Methylated spruce lignin and its synthetic formation. Chem. Ber. 83, no. 6: 530-3 (October, 1950). [In German]

Methylated sprucewood (38% methoxyl) is treated with formic acid containing 10% acetyl chloride for four days at 20°C.; the mixture is centrifuged, and a 10% residue with a 70% lignin content is left. The clear solution is concentrated *in vacuo* and poured into water. The precipitate is washed with water, remethylated with dimethyl sulfate, and subjected to another treatment with formic acid-acetyl chloride. Methylation and treatment with formic acid-acetyl chloride is repeated three additional times; 35% (based on the lignin in the wood) of a methyl lignin (I) is obtained which has 68.1% carbon, 6.4% hydrogen, 34.3% methoxyl, and 1.53% hydroxyl. Methylation of DHP with diazomethane gives a partially methylated product with 22% methoxyl. On further methylation with dimethyl sulfate a methylated DHP (II) with 31-33% methoxyl is obtained. Treatment of (II) with formic acid-acetyl chloride in the same way as the methylated sprucewood gives a methyl-DHP (III) with 68.4% carbon, 6.5% hydrogen, 31.4% methoxyl, and 3.06% hydroxyl. The ultraviolet absorption curves of (I) and (III) are identical, except for a somewhat stronger absorption of (I) in the near ultraviolet. 2 tables, 1 figure, and 4 footnotes. F.E.B.

SCHUBERT, WALTER J., and NORD, F. F. A methoxyl-containing

lignin-like component of the mold *Trametes pini.* J. Am. Chem. Soc. 72, no. 11: 5337-8 (November, 1950).

The concentrated mineral acid-resistant residues from fungi have been considered to be lignin, although without supporting analytical data. An experiment was undertaken to determine the nature of this fraction of a fungus and to attempt to isolate it. The enzymatic formation from carbohydrate of a fungal product containing 12.7% methoxyl and resembling true lignin in many respects was demonstrated in the wood-rotting fungus, *Trametes pini.* 1 table and 8 footnotes. M.W.

LIGNIN—ABSORPTION SPECTRA

FREUDENBERG, KARL, SIEBERT, WOLFGANG, HEIMBERGER, WERNER, and KRAFT, RICHARD. Infrared absorption spectra of lignin and ligninlike products. Chem. Ber. 83, no. 6: 533-8 (October, 1950). [In German]

The infrared absorption spectra of coniferyl alcohol (I), coniferyl aldehyde, native spruce lignin (Brauns), DHP, ammonium spruce lignosulfonate, ammonium DHP-sulfonate (II), methylated DHP (III), methylated spruce lignin isolated with formic acid-acetyl chloride (IV), (II) treated with (IV), and of dihydrodehydrodiisoeugenol methyl ether have been determined with films prepared by dropping solutions of equal concentrations in 80% dioxane on hot salt plates. The significance of the curves is discussed in detail. The spectra of DHP, (II), and (III) show striking resemblance with the corresponding spruce lignin preparations. These results support the concept that lignin is formed by dehydrogenation of (I), followed by polymerization of the manifold diradicals and quinonemethides formed. 2 figures and 5 footnotes. F.E.B.

MACHINERY

PAPER MILL NEWS. Depreciation of machinery and equipment in pulp and paper mills. Paper Mill News 73, no. 46: 108-9 (Nov. 18, 1950).

The results of a depreciation survey for pulp and paper machinery based on a cross section of pulp and paper mills in the United States are listed for amortization periods up to 50 years. 1 table. M.W.

MACHINERY—CALENDERS

CHASE, DONALD C. Trends in calenders and calendering in the U. S. Brit. Plastics 23, no. 257: 122-5 (October, 1950).

Trends in the calendering of vinyls are discussed under the headings of material treatment prior to calendering, types of calenders, temperature control, calender bearings, power and gearing, uniformity of gage, high-speed calendering, matte finish, take-off embossing, and wind-up. The trend is toward greater widths, thinner gages, more uniform thickness, heavier rolls, and material which can be slit and wound up in a uniform manner. 2 illustrations. M.W.

MACHINERY—CONVEYORS

KIRKPATRICK, R. E. Power calculations for chain and cable pulpwood conveyors. Pulp Paper Mag. Can. 51, no. 11: 130, 133-5, 137 (October, 1950).

The author reviews various widely used chain- and cable-conveyor formulas for determining power requirements, points out the assumptions made in

the derivation of these formulas and gives some indications of their effects on the final results, and suggests a formula which, in the form of a nomogram, might be of assistance to the operator. Three of the formulas will give reasonably accurate results for the ordinary conveyor working under ordinary conditions with wet or frozen wood; the nomograms, with reasonable care, will give equally accurate results in much less time. These facts do not hold for abnormal conditions, such as much loose bark, dry wood on a dry conveyor, etc., for which further studies are needed. 4 figures. E.S.

MACHINERY—CURLATOR

SKINNER, HAROLD A. The Curlator as a pulp refiner. Paper Trade J. 131, no. 20: 24-5 (Nov. 16, 1950); *cf.* B.I.P.C. 19: 555-6; 20: 923.

The application of the Curlator to the successful refining of the mill's No. 2 sulfite (screenings) is described, thereby transforming the screenings into quality pulp. The mode of operation of the machine is outlined briefly. E.S.

MACHINERY—DRYERS

ANON. Roller bearings feature in drier rolls. Can. Pulp Paper Ind. 3, no. 11: 24 (November, 1950).

A new drier section is described which was recently installed on the Fourdrinier board machine at the Wilmington mill of the Container Corp. of America. The drier rolls are equipped with double-shell steel plates, roller bearings with pillow blocks, circulating-oil lubrication, and condensate-removal pipes. 3 illustrations. M.W.

FIEBERTS, HARRY. Welded steel drier rolls; increased paper production and reduced maintenance. Paper Trade J. 131, no. 18: 21-3 (Nov. 2, 1950); *cf.* B.I.P.C. 17: 234.

Reference is made to the increased acceptance of welded, jacketed steel drier rolls by the paper and board industries. The construction and advantages of such rolls are discussed, including improved drying and condensate removal, which result in higher production rates at higher pressures as well as with low-pressure operation, improved quality of products, and low maintenance cost. The double-shell construction can also be applied successfully to Yankee driers. 1 table and 4 figures. E.S.

PATERSON, H. A. The Cowie scraper. Pulp Paper Mag. Can. 51, no. 11: 96-100 (October, 1950).

The Cowie internal scraper for the efficient removal of condensate from paper machine driers is described, as well as experiments with it on a sweat drier and full-size drying cylinders. 7 figures. E.S.

MACHINERY—REFINERS

SUTHERLAND, LIONEL M. The Sutherland single rotation disc refiner. Paper Trade J. 131, no. 21: 25-9 (Nov. 23, 1950).

The construction and characteristics of the refiner are described. Photomicrographs of treated pulps with various degrees of fibrillation are included. The equipment is essentially a high-production unit with great flexibility resulting from finger-tip control over throughput and applied power. Many kinds of native and foreign woods, cooked by the soda, sulfate, sulfite, and neutral sulfite methods, are processed into a wide variety of papers by Sutherland refiners. 12 figures. E.S.

MACHINERY—SAWS

CHAMBERLAND, H. J. Bandsawing corrugated, solid fibre. Am. Boxmaker 39, no. 11: 10, 12 (November, 1950).

The three types of blading recommended for fiber, the precision standard pitch, the buttress or special coarse pitch, and the scalloped-edge blade, are described. General recommendations are given for solid fiber and fiber tubes and for corrugated paper and board and plain cardboard. The precision standard pitch is used exclusively to cut the fiber materials and, for general efficiency, the scalloped-edge blade should be given prime consideration for corrugated paper and plain cardboard. When the height of cut requires it, the pitch buttress can be used on corrugated cardboard. 4 figures. M.W.

MACHINERY—SCREENS

ANON. The Stadler-Hurter revolving bark screen. Pulp Paper Mag. Can. 51, no. 11: 116 (October, 1950).

The machine is designed to remove the excess water soaked in the bark after sluicing from the barking drums; it was developed to prevent stream pollution by collecting all solid matters previously discharged into the rivers. It is not intended to dry the bark, but to prepare it for storage or the bark press prior to its use as a fuel. 2 figures. E.S.

MACHINERY—SULFUR BURNERS

LIPPMAN, ALFRED, JR. Improvements in rotary sulfur burner. Ind. Eng. Chem. 42, no. 11: 2215-17 (November, 1950).

A description is given of four improvements in a rotary sulfur burner which permit the burning of sulfur even with a high bituminous content, automatically and at much greater capacity, uniformity, and safety. These improvements comprise: tilting the burner to establish a continuous overflow of sulfur to purge bituminous material; fins within the burner to increase the interior surface area and to cause droplets of molten sulfur to fall through the hot gas to ash the bituminous matter; insulation on the shell to utilize the heat more effectively; and a unique automatic level controller for smooth, economical, and safe operation. The combination has increased the burner capacity over 2.5 times. 2 figures. E.S.

MACHINERY—SULFUR MELTER

AXELRAD, B. A., and NELSON, L. A., JR. High-rate sulfur melter. Ind. Eng. Chem. 42, no. 11: 2212-15 (November, 1950).

Production of sulfur by the Frasch process, although yielding a product of high purity, results in an accumulation of a large tonnage of unsalable contaminated sulfur during the life of the mine. No commercial equipment had been developed to recover this sulfur, and pilot-plant operation was required to furnish the basis for the design of a high-rate, high-capacity melter and auxiliary equipment. Foaming of the sulfur during the melting step and corrosion of equipment because of the moisture and acid content of the contaminated sulfur were other serious problems. The authors illustrate the value of pilot-plant research in determining the unknown factors of a process. 2 figures and 9 references. E.S.

MACHINERY—WIRES

DE PAPIERWERELD. Felts, wires, dandy rolls. Papierwereld. Documentaire Monografie no. 2: 5-13, 15-20 (1950). [In Dutch]

This monograph contains the following articles on machine clothing, listed by titles and authors: Dollfus, Jean-Jacques. Paper machine felts—3 illustrations, p. 5-7, 11; Garteiser, A. Machine wires in paper mills—4 illustrations, p. 8-10, 12, 15-16; Les Toiles Métalliques de Rai-Tillières, Paris. Dandy rolls—5 illustrations, p. 13, 17-19; Anon. Wire numbers (English, French, and Dutch count compared with centimeters)—1 table, p. 20. E.S.

MATERIALS HANDLING

BROMLEY, W. S. Improved methods of handling pulpwood. Paper Trade J. 131, no. 18: 18-21 (Nov. 2, 1950).

The author describes the use of loading docks, winches, trucks, and conveyors in the loading and unloading of pulpwood by the piece. The Dixie Logger system of moving pulpwood on pallets is discussed. Several new methods of handling wood in bundles are outlined, as well as the movement of pulpwood in the form of chips. Attention is drawn to the urgent need for more time and cost studies in the pulpwood industry, which so far has not made adequate use of these techniques. 10 figures. E.S.

CLARK EQUIPMENT COMPANY. Handling larger loads . . . for economy. Paper Mill News 73, no. 44: 13, 18 (Nov. 4, 1950).

The Kalamazoo Vegetable Parchment Company has replaced manual handling of pulp bales and sheets with fork trucks, with a considerable saving of time and money, as well as increased safety for workers. A description of the handling procedures and some figures concerning the economy of the process are included. 3 illustrations. M.W.

HELVERSEN, F. D. Outstanding material handling practices in the pulp and paper industry on the West Coast. Tappi 33, no. 11: 14A, 16A, 18A, 20A, 22A, 24A, 26A, 28A (November, 1950).

The author cites examples of West Coast developments in materials handling as applied to logging, wood and chip handling at paper mills, pulp handling from machine to railroad car, newsprint handling from shipboard to storage or vice versa, paper-roll handling for usage in making corrugated boxes, the handling of carton blanks in the stitching operation of a box factory, and the material-handling system in a converting plant and a wholesale warehouse. In conclusion, experiments with unit loads of cartons and counter rolls are discussed; the former have been very successful, whereas the latter present certain problems, such as gluing troubles and defacing of the rolls when they are torn apart. 22 figures. E.S.

MATERIALS OF CONSTRUCTION

THE BLACK-CLAWSON COMPANY. Ductile iron castings. Fibre Containers 35, no. 11: 79 (November, 1950).

A new type of magnesium-treated iron casting called BlaCaloy has been developed. The new iron is superior to conventional gray iron with respect to tensile strength, ductility, toughness, finish, temperability, weldability, and is equally as good in machinability and corrosion resistance as regular, high-alloyed gray iron. Its ductility and high strength approach those of cast steel. This iron is used in place of gray iron when increased strength and toughness or reduction in over-all weight are desirable. 4 illustrations. M.W.

CHEMICAL ENGINEERING. Construction materials in the paper

industry. Part I—Stock handling. Chem. Eng. 57, no. 9: 211-12, 214-19; no. 10: 218, 220-3 (September, October, 1950).

In this symposium various materials of construction are evaluated for service in the paper industry. The materials discussed in relation to stock handling are: lead; Monel, nickel, Inconel, and Ni-Resist; Worthite; cements; iron and steel; rubber; and coatings. The specific uses and particular advantages are described in each case. Tables are included for the comparison of the Monel, nickel, Inconel, and Ni-Resist group. 14 tables and 1 illustration. M.W.

CHEMICAL ENGINEERING. Construction materials in the paper industry. Part II—Bleaching. Chem. Eng. 57, no. 10: 217-18; no. 11: 255-6, 258-9, 261-4 (October, November, 1950).

An evaluation is given for each of the following materials with respect to their corrosion by the various bleaching solutions: high-silicon irons, cements, nickel and nickel alloys, Chlorimet, Durimet 20, tantalum, iron and steel, Worthite, coatings, lead, and rubber. 5 tables and 2 illustrations. M.W.

CHEMICAL ENGINEERING. Materials of construction. Chem. Eng. 57, no. 11: 107-54 (November, 1950); *cf.* B.I.P.C. 19: 251.

The 14th report on materials of construction is presented. It is divided into 13 sections, each of which deals with one of the following corrosive chemicals: acetic acid, ammonia, caustic soda, chlorine, fatty acids, hydrochloric acid, hydrofluoric acid, nitric acid, phosphoric acid, sodium chloride, sulfur, sulfur dioxide, and sulfuric acid. Under each section, the major types of construction materials are discussed; the information on these materials has been highly condensed, with the elimination of literature references, theory, details on corrosion rates, and test conditions. Flowsheets of manufacturing processes and a directory of materials which lists the manufacturer, a description, and the most important applications are included. 16 illustrations and 8 flowsheets. M.W.

HANSON, D. B. Tetrafluoroethylene resin in process equipment. Tappi 33, no. 11: 541-4 (November, 1950).

Since its discovery 10 years ago, the manufacture of Teflon (tetrafluoroethylene resin) has come through the pilot-plant stage and reached commercial-scale production. The material is completely inert to practically all chemicals and solvents, and has outstanding heat-resistance and electrical properties, and an unusual ability to resist the sticking of very tacky materials. Methods of handling, available forms, properties, and applications are described. 1 table. E.S.

TEEPLE, H. O. The use of nickel containing alloys in the pulp and paper industry. Paper Trade J. 131, no. 19: 28, 30-2; no. 20: 19-23; no. 21: 14-15, 18-19, 21-5 (Nov. 9, 16, 23, 1950); *cf* B.I.P.C. 21: 175.

The literature on the use of nickel alloys to prevent corrosion in the various pulping processes, in by-product chemical recovery, and in the handling of pulp from the digesters through the paper machine is discussed; paperboard operations and bleaching are also included. The nickel alloys are divided into two groups: the nickel and nickel-base alloys, and the austenitic stainless steels; in addition, there is also some discussion of the nickel-alloyed cast irons. 34 tables, 11 illustrations, and 80 references. M.W.

METERS AND RECORDERS

HORVICK, E. W. Ball float type liquid level controllers; an evaluation of their role in industrial processing. Paper Trade J. 131, no. 19: 33-4, 36 (Nov. 9, 1950).

Ball-float liquid level controllers provide the least expensive and simplest method of controlling liquid level. Different units and their applications are discussed, including float-valve controllers, internal float-type liquid level controllers, float cage-type liquid level controllers, and air-pilot actuated, remote controllers. 5 figures. E.S.

REPUBLIC FLOW METERS COMPANY. Automatic batching of fluids speeds production and prevents errors. Chem. Processing 13, no. 11: 12-13 (November, 1950).

A control system is described for regulating the charges to a digester. Before its installation in a Florida pulp and paper mill, each fluid batch charge was first pumped from a large storage to a measuring tank and, after the tank had been filled to the proper level, to the digester. In the automatic batching system, the pump is actuated by a push button and automatically de-energized when the desired batch has been delivered. The intermediate step of measurement in a batching tank and one pumping operation are thereby eliminated. The details of the control device are described. 2 diagrams. E.S.

MILL CONTROL

PATTE, W. E., and CRABTREE, H. Methods of control of stock treatment. Pulp Paper Mag. Can. 51, no. 11: 115-16 (October, 1950).

The need for control methods in the beater room will vary from mill to mill, depending on the type or types of furnish employed. The author describes control methods applicable to the charging of the beaters, the beating operation, consistency regulation, and jordaning or refining; however, not all stock-preparation systems will require all these controls. Management must decide the amount of money which can be spent on control; the use of this money to best advantage then becomes a technical responsibility. E.S.

MILL MANAGEMENT

DUNNING, HARRISON F. Human relations in industry. Tappi 33, no. 11: 101-4A (November, 1950).

The author emphasizes the necessity for supplementing technical knowledge and training with the ability for making it effective through people, since only people start, stop, and do things. E.S.

LANGFORD, R. Personnel management. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 31, no. 2: 337-46; discussion: 347-51 (June, 1950).

The author presents a broad outline of the principles and technique of good personnel management, the work it involves, and the natural qualities demanded of a personnel director. E.S.

MOORE, W. CLEMENT. Don't let anybody sell you a wild goose. Boxboard Containers 68, no. 695: 36, 69 (November, 1950).

A calendar of management methods and order of initiation in industry is presented. M.W.

WELLS, J. O. The rediscovery in labor relations. Paper Trade J. 131, no. 19: 23-4, 26-7 (Nov. 9, 1950).

In discussing the desires of labor, the author emphasizes that it is not wages and security which are of first concern, but the fair treatment of the worker as an individual. E.S.

NEWSPRINT

LAROCQUE, GERARD. Better printing from newsprint. Am. Pressman 60, no. 6: 27-8 (May, 1950); Share Your Knowledge Rev. 31, no. 11: 27-30 (September, 1950).

The author discusses the role which newsprint paper plays in printing, some of its shortcomings (with particular reference to color, transparency, smoothness, and ink absorption), and possible remedies. Mills should be kept informed about the printing quality of their paper. Samples printed under identical conditions but at different times should be sent regularly to the mills, including the serial number or other identification marks of the rolls, so that the mills may check into the conditions existing at the time of manufacture. A very important factor which restricts improvements in quality is the tariff definition of duty-free newsprint. At present any incentive for improvements is stifled, because the tariff prohibits any significantly better newsprint. E.S.

MACLAURIN, D. J. Newsprint and quality printing. Am. Pressman 60, no. 8: 10-12, 50-1, 56 (July, 1950).

The author discusses the causes of web breaks, strike- and show-through, grayness in solids, and offset, as related to paper quality, and precautions to be taken in the paper mill for their avoidance and control. The system of quality control used by the newsprint mill at Powell River is outlined briefly, and future improvements in press, type, and ink, and their repercussions on newsprint quality are mentioned. E.S.

OILS AND FATS

GUTKIN, S. S. Miscellaneous uses of drying oils. J. Am. Oil Chemists' Soc. 27, no. 11: 538-44 (November, 1950).

In a general discussion of the miscellaneous applications of drying oils, the use of tall oil as a core oil, the use of stiffening and tempering oils in the manufacture of pressed hardboards, and the use of drying and semi-drying oils in paper coatings are mentioned. 5 references. E.S.

PACKAGING

BLISS, RICHARD H. Various methods of war packaging. Am. Paper Merchant 47, no. 11: 18, 24 (November, 1950).

The principal methods used in the preservation and packaging of military material, I, I-A, II, III, and combinations and variations, are described (*cf.* B.I.P.C. 16: 81-2). M.W.

HOLBROOK, HERBERT T. Wake up, Uncle Sam! Modern Packaging 24, no. 3: 73-6, 175, 177 (November, 1950).

The author discusses the failure of the government to keep up-to-date the packaging specifications which were developed during the war. Now export specifications are either inadequate or nonexistent. A series of suggestions for effective action is given. They are: (1) The importance of packaging

must be recognized, and its cost considered as part of the cost of the article itself; (2) a centralized authority must be established for supervising the packaging of all the services; and (3) a leader who is familiar with military packaging requirements should be appointed to head the centralized authority. M.W.

SOUTHWICK, CHARLES A., JR. Military status of flexible packaging. Modern Packaging 24, no. 3: 121-4 (November, 1950).

A discussion is given of new flexible packaging materials that will probably fulfill military requirements. The Method II barrier material consists of a vinyl film laminated to aluminum foil which is laminated to polyethylene film and then to cotton scrim. A comparison between the physical properties of this new barrier and the butyrate, foil, kraft, asphalt, and scrim laminate formerly used is summarized in a table. Various other possible military uses for polyethylene are described. Grade C-type materials, cellulose acetate film combined with scrim and coated with microcrystalline wax, will be used extensively for packaging of metal parts. The quantity of cellophane consumed directly by the armed forces will be small. Plastic films will again be used, and applications will be found for vapor-phase-inhibitor materials in the prevention of corrosion. A new plastic film, 'Terylene," which is somewhat analogous to polyethylene, is described. In conclusion, suggestions are given to civilian users of these materials concerning means of securing them in the event that government demands diminish the supplies. A list of current military specifications covering the principal packaging materials and methods is appended. 1 table and 4 illustrations. M.W.

PAPER—COATED

ANON. Coated offset papers. Am. Pressman 60, no. 9: 18, 46 (August, 1950).

A discussion is given of the problems encountered in using coated papers for offset printing. The importance of using coated papers which are made for this process is stressed. Reasons for lower production, such as the greater tendency of coated papers to buckle, wave, or curl, and the tendency to stick if moistened, are given. Excessive ink, excessive water, the condition of the blanket, cylinder settings and packings, and stocks are some of the factors which influence the quality of print on coated offset papers. M.W.

FROST, FREDERICK H., and REYNOLDS, A. P. A new principle in lithographic paper manufacture. Proc. First Annual Tech. Meeting, Tech. Assoc. Lithographic Ind.: 9 p.; discussion: 2 p. (1949).

Seven facts are presented which the authors believe have an important bearing on the relationship between offset lithography and paper made for this process. Theories are constructed from these facts which indicate that, up to the present time, lithographers have had the choice of purchasing a paper which will perform well on the offset press but will produce poor quality results and offset, or a product which will give a high quality of reproduction but will perform poorly on an offset press. A theoretical outline is given of the manner in which a paper might be constructed which would give maximum quality of reproduction and, simultaneously, maximum ease of operation. Illustrations of production trials made according to this theory are presented to support or deny the validity of this theory for making coated paper for the offset process. The process involves the manufacture of a paper which has a strong affinity for ink, but at the same time a weak affinity for water. The double-coating principle developed by the S. D. Warren Co. (*cf.* B.I.P.C. 21: 139) was of major importance in this study. E.S.

RUNDELL, FORREST. Problems a printer meets in coated paper and the safest ways for handling them. Inland Printer 126, no. 1: 63-5 (October, 1950).

Some of the problems and pitfalls encountered in printing glossy-, dull-, and cast-coated papers are discussed, and suggestions for their avoidance or remedies are listed. E.S.

STEELE, C. W. Coating papers on the Fourdrinier and press sections. Paper Trade J. 131, no. 21: 30, 32-4 (Nov. 23, 1950); Paper Mill News 73, no. 50: 10, 12, 16, 18 (Dec. 16, 1950).

The author describes the machine-coating process developed for lightweight sheets by the Combined Locks Paper Co., which is covered by U. S. patents 2,398,843, granted to Muggleton and Piepenburg on April 23, 1946, and 2,426,043 (*cf.* B.I.P.C. 18: 71-2), granted to Muggleton on Aug. 19, 1947. The advantages and economics of the process and the increasing demand for lightweight coated papers in the publication grades are discussed. E.S.

PAPER AND PULP INDUSTRY

AMERICAN PAPER CONVERTER. Outlook for paper converting industry under N.P.A. Am. Paper Converter 24, no. 11: 10-11, 36 (November, 1950).

The organization, regulations, and priority ratings of the National Production Authority as they apply to the pulp, paper, and container industries are outlined. M.W.

ANON. The forest industry in Sweden. Norsk Skogind. 4, no. 9: 243-4, 246-7 (September, 1950). [In Norwegian]

Statistical data for Sweden's forest industry and forest products, including exports to different countries, for 1949 are given; in some cases a comparison with the years 1937, 1947, and 1948 is made. 5 tables. E.S.

CHEMICAL ENGINEERING. The next ten years. Chem. Eng. 57, no. 11: 158-9 (November, 1950).

An estimate of the growth of the chemical process industries in the next decade has been prepared by the Department of Economics of McGraw-Hill. Individual estimates for nine large fields of the chemical process industries (including the paper industry) are presented in a series of graphs, on which the actual growth between 1940 and 1950 is also shown. All the estimates point to a sizable increase in production by 1960. 11 graphs. M.W.

PRINGLE, JOHN W., and LAUER, B. E. Pulp and papermaking prospects in western Colorado. Tappi 33, no. 11: 38A, 40A, 42A (November, 1950).

The essentials for the development of a pulp and paper manufacturing operation on a moderate scale are all present in the Colorado area. The National Forests of the state can provide some 38,000,000 cords of mature and readily accessible green timber. In addition there are several million cords of beetle-killed spruce standing in a small area in the western part of the state. All of this should be removed entirely for pulping purposes. There is a good supply of water available from the Colorado River and several of the tributaries of this river west of the Continental Divide. The supply of coal for fuel is unlimited, and gas and oil fields are being developed rapidly. The development of federal reclamation projects is expected to increase the

supply and decrease the price of electric power in western Colorado. The railroad network is good for both interstate and intrastate shipment. Markets are available in the area; the newspapers, sugar producers, cement manufacturers, and agricultural interests offer the best immediate outlets. 2 tables, 4 maps, and 5 references. E.S.

STEVENSON, LOUIS T. Outlook for paper and paper containers. Am. Boxmaker 39, no. 11: 27-8 (November, 1950); Paper & Paper Products 92, no. 4: 1, 15 (Nov. 5, 1950); Paper Mill News 73, no. 44: 16, 23 (Nov. 4, 1950); Am. Paper Merchant 47, no. 12: 24, 51 (December, 1950).

A shortage of paper and board exists which cannot be explained by a decrease in production, which in 1950 is exceeding that of 1949 by three million tons. The explanation seems to lie in the fact that manufacturers allowed their pulp inventories to be depleted because of price uncertainties, and as a result the scare buying stimulated by the Korean war rose to a maximum. Imports of pulp have been maintained, and substantial additional productive capacity indicates an increase in production in the next few months. In the event of all-out war conditions, increased consumption for direct government use and defense plants would exceed present production by only 20%. Indications are, therefore, that the supply of paper and board will return to normal as soon as scare buying subsides. M.W.

PAPER AND PULP INDUSTRY—EDUCATION

BROUGHTON, GEOFFREY. Paper engineering at Lowell Textile Institute. Barrell's Paper Annual, 1950-1951: 14-16 [1950]

Reference is made to the new four-year courses in paper and leather leading to the degree of Bachelor of Science, which commenced at the Lowell Textile Institute in September, 1950. The curriculum and facilities of the Department of Paper are described briefly. 2 illustrations. E.S.

WHEELWRIGHT, WILLIAM BOND. Progress in papermaking. Barrell's Paper Annual, 1950-1951: 6-13 [1950]

The author mentions certain highlights in the history of papermaking since its invention by Ts'ai Lun about the year 105 A.D. and concludes with the transformation of papermaking from a manual art to a mechanical industry in the 20th century and the formation of educational centers for the specific training of paper technologists. 6 illustrations. E.S.

PAPER AND PULP MILLS

ANON. Powell River to increase capital investment 25%. Can. Pulp Paper Ind. 3, no. 11: 14-15 (November, 1950); Pulp & Paper 24, no. 13: 94 (December, 1950).

Powell River has launched a new expansion program. The new project is intended to increase efficiency and step up production to meet demands for newsprint. One of the major plans is the construction of new wharf facilities. Other features include a new boiler, a new steam turbine generator, the installation of another hydraulic barker and small log-handling machinery, sawmill improvements, speed-up of existing paper machines, and a groundwood mill extension. 5 illustrations. M.W.

ANON. San Angel mill in Mexico starts producing pulp, paper. Paper Mill News 73, no. 46: 52, 55-6 (Nov. 18, 1950); Paper Trade J. 131, no. 19: 12, 14 (Nov. 9, 1950); Paper Ind. 32, no. 9: 956-7 (December, 1950).

The first paper at the new mill of Fabricas de Papel Loreto y Pena Pobre, San Angel, D. F., Mexico, was produced on October 18, 1950. The new unit is located adjacent to the company's present two-machine mill and consists of a groundwood mill, a paper mill, converting plant, and power plant. A brief description of the new equipment is given; the paper machine is a 132-inch Rice-Barton Fourdrinier with General Electric sectional drive, on which either creped or flat papers can be produced. The mill was designed by Charles T. Main, Inc. of Boston; the construction of the buildings and installations of equipment were handled by the mill's own engineering force, using local contractors. 7 illustrations in the first, and 4 in the second reference. E.S.

ST. REGIS PAPER COMPANY. St. Regis new mill at Jacksonville; two kraft machines—pulp mill. Paper Mill News 73, no. 46: 41 (Nov. 18, 1950); Southern Pulp Paper Manuf. 13, no. 12: 68 (December, 1951).

Plans for two new kraft paper machines and pulp manufacturing facilities have been announced by the St. Regis Paper Company. One will be added to the company's kraft mill at Pensacola, Florida; the other will be a new mill at Jacksonville. The new mills will permit the utilization of the company's own wood for the production of specification kraft paper for the manufacture of multiwall bags, rather than the imported pulp which has been used by the company's New York mills for this purpose. The activities of the New York mills will not be curtailed but rather concentrated on the production of specialty paper products from bleached or unbleached kraft. Some figures concerning the growth in the use of multiwall bags are included. M.W.

PAPER MACHINE OPERATION

CLINK, GEORGE E. Standardization of paper machine design. Tappi 33, no. 11: 32A, 34A (November, 1950).

The author discusses the need for standardizing the various factors which determine the design of paper-machine parts, with particular reference to wire and felt tensions and nip pressures. These factors vary considerably from mill to mill and from machine to machine, so that definite figures are not yet obtainable. However, a survey of the industry might narrow the range and a definite pattern might be established for various papers and machines. The collection, compilation, and correlation of existing data (some of which have never been published before) are suggested for the benefit of the entire industry. E.S.

HYER, ALLAN. Factors in paper machine operation at high speeds. Pulp Paper Mag. Can. 51, no. 11: 109-11 (October, 1950).

Following a brief historical introduction dealing with previous record speeds of paper machines, the author discusses the important factors in headbox design and the wet-end and drier sections of the Fourdrinier paper machine which exert an influence upon its rate of operation. E.S.

PAPER MANUFACTURE

ANON. The romance and utility of paper: a general reference for users of papers and boards. Part 5. Paper Making and Paper Selling 69, no. 2: 10-13 (Summer, 1950); *cf.* B.I.P.C. 20: 728.

The uses of various types of board and paper are described. Newsprint is mentioned briefly, and general notes covering paperboards used for purposes other than printing are included. Finally, paper is discussed under the categories of printing, wrapping, writing, and miscellaneous. M.W.

PAPER SPECIALTIES

ANON. Air mail envelopes. Paper Making and Paper Selling 69, no. 2: 7-8 (Summer, 1950).

The views of British and American postal authorities with regard to air-mail envelopes are presented. British recommendations include white or light-colored envelopes of paper that is opaque and not highly glazed or mottled. Colored borders are not favored, and lightweight paper is suggested because of weight restrictions. The United States Postmaster General recommends white envelopes with the red and blue parallelogram border to distinguish them from ordinary mail. Heavier paper is preferred, and it is pointed out that its use would be unlikely to result in an excess of the maximum weight specification. M.W.

BURGESS CELLULOSE COMPANY. Laboratory control in making stereotype mats. Am. Pressman 60, no. 3: 110-13 (February, 1950).

A review of the progress made by the Burgess Cellulose Co. in the stereotype-mat business is given. The various processes involved in making stereotype mats are outlined. 8 illustrations. M.W.

CARLSSON, GÖSTA E., and ANDRÉSEN, R. Investigation of the molding of sterotyping mats (flongs). Grafiska Forskningslaboratoriet Medd. no. 22: 3-38 (November, 1949). [In Swedish; English summary]

In molding a stereotyping mat from a halftone block, an appreciable loss in depth between the dots occurs. The loss in depth is a mathematical function of the tonal value of the block, with a maximum at 65% printing area; here, the loss in depth is about 50%. No loss in depth occurs in casting. The properties of the mats are of great importance for the molding result; a mat should be plastic, yet tenacious. The influence of molding time, pressure, temperature, moisture content, and blanket on the molding depth was investigated. It was observed that a molding time of at least two minutes is necessary, that the influence of the moisture content of the mat is considerable, and that a temperature rise over 50°C. has very little effect. In molding one harder and one softer mat, it was established that a 100% higher pressure is necessary for obtaining the same depth in the hard mat. An increase in time alone could not bring about the same depth, but it could be obtained if the moisture content of the harder mat was increased from 20 to 23%. When a block is duplicated through a mold, from which a flat stereotype is cast (which again is molded), it is extremely important that both moldings should be carefully made and that a special soft mat be used for the first molding. The importance of correct moisture content of the mat in molding and complete drying of the mold before casting is stressed. 16 tables, 20 figures, and 4 references. E.S.

CHASE BAG COMPANY. Paper covers for drums. Chem. Inds. 67, no. 5: 786 (November, 1950); Chem. Processing 13, no. 12: 89 (December, 1950).

Reference is made to barrel and drum covers manufactured by the company from heavy kraft paper containing a small percentage of neoprene synthetic rubber, which is incorporated in the beater. The covers are useful where barrels and drums are employed for handling material in process for protecting the contents from rain and foreign particles. The neoprene adds to the wet strength of the paper and imparts resistance to sunlight, oil, and chemicals. E.S.

E. I. DU PONT DE NEMOURS & COMPANY. Saved—cash on barrel head. Food Inds. 22, no. 11: 1919-20 (November, 1950).

Reference is made to slip-on barrel covers of neoprene-treated kraft paper, which resemble refrigerator-bowl covers and which were invented by a foreman at Du Pont's Deepwater plant. Several paper manufacturers have now developed commercial production methods. 2 illustrations. E.S.

MACK, HEINZ. Paper from long-fibered raw materials. Wochbl. Papierfabr. 78, no. 17: 511-13 (Sept. 15, 1950). [In German]

Paper sheets for impregnation must be voluminous and possess high tensile and tear-through strengths, in addition to a high absorptivity. During stock preparation in the beater, the tensile strength can only be increased by raising the beating degree; this, however, results in a simultaneous decrease of the tear-through strength. For absorptive papers, pulps with long, twisted, curly fibers are selected, which give papers of low density. These, however, should not be beaten in the hollander, even with raised beater roll, or the fibers are brushed out and deprived of their beneficial curliness. Recent stock-preparation techniques with high-speed jordans yield pulps with improved strength properties, without a simultaneous increase in the beating degree (*cf.* Müller-Rid and Jensen, B.I.P.C. 20: 571); from these it should be possible to manufacture improved, voluminous, absorptive papers of low density and good strength properties. Directions for the handling of long-fibered, little-beaten pulps upon the Fourdrinier machine are given to obtain uniform fiber distribution and sheets with noncloudy formation, including high dilution of the stock, uniform stock distribution from the headbox across the entire width, and slow drainage of the water through the wire. The need for extensive sheet-formation experiments is emphasized, which should be carried out upon the paper machine proper, and not upon laboratory sheet molds. 2 figures and 4 references. E.S.

PAPER SALES. Twisted paper products. Paper Sales 10, no. 11: 19-20, 38, 40, 42 (November, 1950).

Twisted paper products are yarns, cords, braids, or twines which are made entirely of paper or with paper as the major component. They are available in standard varieties, and, although they have limitations, may be successfully substituted for hard and soft twines in many cases. In a series of questions and answers the cord and its manufacture are described, and its advantages and sales opportunities are discussed. 2 illustrations. M.W.

SCHAFFERT, R. M. A scientific analysis of stereotype dry mat molding. Am. Newspaper Publ. Assoc., Research Bull. 20: 113-68 (Nov. 29, 1949).

The dry mat molding process is analyzed from the standpoint of the methods used and the behavior of the materials involved. Molding blankets, dry mats, and various type materials have been subjected to numerous laboratory tests, singly and in combination, in an effort to localize the shortcomings of each. The chief disadvantages encountered in the use of molding blankets are their slow recovery after compression and their change in properties with use. The dry mat itself is the greatest offender. Because of its inherent properties, it is not feasible to obtain accurate and faithful reproductions with the material. Future improvements in dry mats could change this situation considerably. A greater strength in type metal and a better quality of cast in the slug face and body will, undoubtedly, improve the results obtained in dry mat molding. However, this would solve only one of the many problems confronting the stereotyper. The greatest need seems

to be for an entirely new type of dry mat capable of greater precision in reproduction. Direct pressure and roller molding are analyzed and discussed. The distribution of pressure under the roller and the total load on roller and bed have been computed. It is concluded that the drag on the roller resulting from unbalanced pressures cannot be satisfactorily overcome by methods now in use. The roller method of molding appears to be less susceptible to variations in impression from page to page in rapid molding than the direct-pressure method now in use. In both types of molding considerable guesswork is involved, and consistent results are difficult to achieve. 13 tables, 9 figures, and 32 graphs. E.S.

THE UNITED STATES ENVELOPE COMPANY. The envelope . . . its origin, development and manufacture. Am. Pressman 60, no. 3: 128-35, 143 (February, 1950).

A history of the envelope is given, and the modern methods of making envelopes are described. 13 illustrations. M.W.

WOOD FLONG CORPORATION. Thirty-five years of dry mat progress. Am. Pressman 60, no. 3: 67-8 (February, 1950).

The history of the dry mat process of stereotyping is reviewed, and the various types of dry mats available today are described. 1 illustration. M.W.

PHYSICAL TESTING—ODOR TRANSMISSION

MULDOON, T. J., COUCH, ROBERT DE S., and BARNES, H. M. Tests for odor transmission through packaging films. Am. Paper Converter 24, no. 11: 14, 46-7 (November, 1950). [Abridgment]

An instrumental test for odor transmission through packaging films is described. The test cell consists of two crystallizing dishes, one inverted over the other. A small Petri dish is suspended from the top dish. When assembled for testing, the Petri dish is filled with methyl furoate, and fairly strong potassium hydroxide is added to the bottom dish. The film to be tested is placed between the two dishes. During storage the methyl furoate volatilizes to fill the upper half of the cell and then diffuses through the test film. It is picked up in the potassium hydroxide solution where it is saponified to the potassium salt of furoic acid. The furoic acid content of the potassium hydroxide is measured on the spectrophotometer. The results are expressed in grams of furoic acid/sq. m./24 hr. Test results obtained with this method are given. 2 tables. M.W.

PHYSICAL TESTING—PAPER—ASPHALT PAPER

KNOWLES, E. C., MCCOY, F. C., SCHWEYER, H. E., and WILKINSON, C. E. Oil exudation property of asphalts. Ind. Eng. Chem. 42, no. 11: 2340-3 (November, 1950); *cf.* B.I.P.C. 16: 519.

The tendency of asphalts to exude oil under suitable conditions has a number of practical aspects—for example, in the manufacture of roofing and laminated paper, where undesirable staining may occur. An accelerated test of considerable flexibility has been developed for measuring this property. The effects of time, temperature, and pressure are considered, as well as the effect of crude source and variations in the method of manufacture. The constructional details of the required apparatus are shown. 3 tables, 6 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HARRISON, V. G. W. Gloss measurement of papers: Application of the Barkas analysis. Brit. J. Applied Phys. 1: 46-53 (February, 1950); Kodak Research Labs., Monthly Abstract Bull. 36, no. 9: 437 (September, 1950). [Abstract only available]

The Barkas analysis (the treatment of surface reflection from paper as being that from a large number of randomly oriented, specularly reflecting, and diffusively reflecting facets) is applied to nine papers of known visual gloss. It is concluded that, although the analysis is of negligible value for practical gloss determinations, it appears to present a useful method of investigating surface structure and finish of paper. It is stated that the gloss of the papers examined appears to be assessed solely by the intensity of light reflected at the specular angle. E.S.

PHYSICAL TESTING—PAPER—INITIAL TEAR

BEKK, JULIUS. Initial tearing strength of paper, board, and the like. Papierwereld 4, no. 21: 286-8 (May 15, 1950); Wochbl. Papierfabr. 78, no. 17: 513-15 (Sept., 15, 1950); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 27, nos. 4-6: 26 (April-June, 1950). [In Dutch and German; abstract in English]

The force required to start a tear from the edge of a sheet of paper or board is significantly greater than that needed to continue the tear once it has been started. The measurement of the initial tearing strength is influenced by the tensile strength of the edge of the material. An apparatus (made by van der Korput, Baarn, Holland) is described for measuring the initial tear. The results obtained with the instrument are tabulated with the corresponding tearing- and tensile-strength values in both machine (I) and cross-machine (II) directions for newsprint; MG kraft and bleached and unbleached sulfite papers; wood-free writing paper; calendered glassine; unbleached, calendered greaseproof; bleached and unbleached, uncalendered imitation parchment; and cellophane. For testing the tensile strength, all sample strips were 15 mm. wide; the clamping distance for the paper samples amounted to 10 cm., and for cellophane to 1 cm. because of its greater stretch. The following conclusions are drawn from the data: The initial tearing strength increases proportionally with the basis weight. The ratio of initial tearing resistance in (I) and (II) increases, in general, with basis weight. For values in the two directions, the difference with initial tearing resistance is not as great as that with tensile strength, though greater than with tearing strength. The ratio of initial tearing strength to tensile strength is, in general, greater with (II) than with (I), and greater with calendered than with uncalendered papers. No relationship with basis weight could be established. The ratio of the initial tearing resistance to the usual tearing strength is always less in (II) than in (I). With beating, the ratio increases, because of the declining tearing strength, but more so in (I) than in (II). A relationship with basis weight could only be established in the case of cellophane, in which the ratio increases simultaneously in both directions. To study the influence of the width of the samples on the initial tearing resistance, test strips varying in width from 1 to 5 cm. were used. A maximum was obtained with a width of 3 cm. The author concludes that the upper and lower edges of the narrower strips are stressed at the moment of the initial tear, thereby affecting the results, whereas with wider strips, the lower edge is not involved and does not exert an influence. All testing work in the present

study was therefore carried out with strips 5 cm. wide. 2 tables and 3 figures in the complete articles. E.S.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

THE INSTITUTE OF PAPER CHEMISTRY. Testing methods for printability of newsprint. Progress Report Three. "The new I.P.C. surface bonding strength tester" for American Newspaper Publishers Association. Am. Newspaper Publ. Assoc., Research Bull. 34: 147-56 (Oct. 17, 1950); *cf.* B.I.P.C. 21: 32-3.

A new instrument has been designed and constructed for evaluating the surface bonding strength, or the resistance to pick, of paper. The force tending to pull fibers from the surface of the paper simulates that in the actual printing operation in a rotary press. A roll carrying a viscous or tacky film is rolled at variable speeds over the surface of the paper mounted on the surface of another roll. The rolls are accelerated from rest to approximately 700 ft./min. The picking force is proportional to the product of the viscosity of the viscous film material and the velocity of the rolls. When this product becomes sufficiently large, the picking force causes failure of the paper. The value of the viscosity-velocity product at the point of failure is a measure of the pick resistance of the paper. 3 figures and 3 references. E.S.

KING, CHARLES F. Instruments are made to be used. Inland Printer 126, no. 1: 79-82 (October, 1950).

The need for reliable instruments in the printing industry is discussed. Smaller plants which cannot afford expensive testing instruments may be helped by the laboratories of the large paper and ink suppliers, independent consultants, or special laboratory services. However, before an instrument or measuring device can be accepted as a basis for standardization, its applicability to the intended purpose must be thoroughly investigated. The author discusses the shortcomings of the Dennison wax test for measuring the pick resistance of paper and refers to a promising new device [Davidson-Pomper pick tester, developed by the John Waldron Corp.] which thus far has given accurate results. The mode of operation of the tester is outlined briefly. However, too few of the new instruments are yet in use to establish its reliability under all conditions and to reveal the limits of its accuracy. E.S.

KOTTE [HANS] Numerical determination of the picking resistance of coated papers. Allg. Papier-Rundschau no. 12: 596-7 (June 30, 1950). [In German]

The Dennison wax pick test and the Davidson-Pomper pick tester developed by the John Waldron Corp. are described. 3 figures. E.S.

VAN DEN AKKER, J. A., and WINK, W. A. Evaluation of the surface bonding strength of paper. Proc. First Annual Tech. Meeting, Tech. Assoc. Lithographic Ind.; 7 p.; discussion: 1 p. (1949).

Tests for measuring the surface bonding strength of paper, which relates to the resistance of paper to picking in the printing operation, are discussed, and a new method is described. Tests in which a transverse force is applied to blocks cemented to the paper would seem to have merit in principle, but are not accurate because the cementing operation modifies the paper, and because localized stress concentration during the application of the load introduces a hidden error; moreover, the stress concentration involved does

not simulate that existing in a nip of a rotary press. The friction tape and "Scotch tape" tests are useful in the hands of experts for the subjective evaluation of the surface bonding strength of paper, but fail to prove a numerical measure of this property. There is almost no fundamental basis for the wax pick test, which is widely used. In the hands of expert operators of good judgment, this test is useful as a guide, but results obtained with the test correlate only crudely with actual performance and, in some cases, the results can be very misleading. In consideration of these difficulties with existing methods, an apparatus for the measurement of the "viscosity-velocity product" (VVP) has been developed. In the new method, the stress which ruptures the paper surface arises in high rate of shear of a viscous film, which is quickly applied to and removed from the paper under carefully controlled conditions which closely simulate the disruptive action occurring in the operation of a rotary press. The apparatus for the development of the method and new equipment currently under design are described. 1 table, 5 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—POROSITY

COUPE, R. R. The air permeability of paper. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 31, no. 2: 383-457 (June, 1950).

A critical survey of the literature relating to the air permeability of paper is presented under the headings: introduction, definition, methods of measuring the air permeability of paper, theoretical considerations relating to the flow of air through paper, results of permeability measurements, direct comparison of various types of instruments, relationship between experimental conditions and the rate of flow, effect of manufacturing variables on air permeability, application of the Kozeny equation to the results of flow measurements on paper, miscellaneous observations, nature of air flow through paper, and general conclusions. 22 tables, 7 figures, and 100 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

KING, CHARLES F. Measuring rate of ink penetration. Inland Printer 126, no. 2: 61-3 (November, 1950).

The author emphasizes the need for an accurate standard method for measuring the rate of ink penetration into lithographic paper and discusses the limitations and shortcomings of the methods at present employed for this purpose, such as pulling proofs with a standard ink and measuring the time until the sheen or gloss has disappeared, the use of K & N testing ink, ink smear tests, etc. E.S.

PHYSICAL TESTING—PAPER—TEARING STRENGTH

HARDACKER, K. W., and VAN DEN AKKER, J. A. Instrumentation studies. LIX. Tearing strength of paper. II. The Brecht-Imset through-tear tester. Tappi 33, no. 11: 109-18A (November, 1950); *cf.* B.I.P.C. 14: 214; 21: 184.

The Brecht-Imset through-tear tester is an instrument designed to measure the tearing strength of paper when it is subjected to a continuing tear. Following a description of the instrument and of the way in which it operates, a theoretical analysis of the method is presented. The mechanics of the Brecht-Imset tester were studied, with particular emphasis on the evaluation of instrument constants and the investigation of the quality of agreement between the theoretical and observed instrument indications. Good agreement

was observed for most, but not all, of the range of the instrument. Seventeen different types of papers were tested in a study of the tearing behavior of specimens torn in the Brecht-Imset and Elmendorf-Thwing testers, and the data obtained were compared. Because of the difference between the ranges covered by the two instruments, different numbers of specimens were torn simultaneously in the two testers. In general, the quality of tear (as regards splitting of the paper) was somewhat superior in the specimens torn with the Elmendorf-Thwing tester. Constant width of the zone of splitting was not observed in the use of the Brecht-Imset tester, where the paper under test had a tendency to split. The advantageous claims which have been made for the Brecht-Imset mode of tearing were not confirmed. The testing of thin, lightweight papers with the Brecht-Imset tester was attended with considerable difficulty, and in many cases a test could not be performed without considerable care on the part of the operator. Certain heavy papers are difficult to test, or cannot be tested at all, because of the tendency of the tear to progress to the side of the test specimen when the Brecht-Imset mode of tear is employed. Relatively little difficulty was encountered in the testing of writing, book, and other papers of ordinary weight. The correlation between the data obtained with the two testers was fairly good, even to approximate numerical agreement in the testing of several types of papers. The results of a study of the influence of the number of specimens which are torn simultaneously are given. The degree of splitting observed in the use of both instruments was strongly dependent on the number of sheets torn simultaneously. 4 tables, 8 figures, and 2 references. E.S.

PLASTIC FILMS—TESTING

PINOIR, R., and DUBOIS, A. Measurement of Young's modulus of fibers and films by a dynamic method. J. phys. radium 9: 20-4 (1948); Kodak Research Labs. Abr. Sci. Pub. 30: 259-63 (1948, pub. 1949). [Abridgment only available]

The dynamic method consists of measuring the velocity of longitudinal waves in a stretched film or thread and determining the density of the material. The apparatus and method of measurement are described briefly. A wave impulse is started at one end of the mounted film by a hammer blow on the clamp. This blow also initiates a sweep circuit which controls the horizontal movement of the beam of an oscilloscope tube. At a known distance along the film, a sensitive pickup contacts the lower side of the film and, through amplification, makes a vertical displacement of the tube beam upon arrival of the wave front. Data are given for nitrocellulose, cellulose acetate, cellophane, vinyl resin, and nylon and cotton threads. A comparison of the dynamic-modulus values with those obtained by a static dynamometer shows that, in general, the former exceed those of the latter by about 40%. The apparatus can also be used for measuring the damping of the vibrations during their propagation. 2 figures and 1 table. E.S.

PLASTIC FILMS (NONCELLULOSIC)

ANON. Cryovac goes retail. Modern Packaging 24, no. 3: 110-11 (November, 1950); Packaging Parade 18, no. 214: 51, 58 (November, 1950).

A vinylidene-type copolymer film (Cry-O-Rap) is being used for prepackaging of processed meats. The film is wrapped around the meat, vacuumized, heat sealed, and heat shrunk with a hot-water bath. The shrinkage results in an airtight, wrinkle-free film which prevents dehydration and reduces mold growth. 4 illustrations. M.W.

PLASTICIZERS IN PAPER

MCPHERSON, WILLIAM H., JR. The mechanism of the softening of paper by glycerin. Tappi 33, no. 11: 531-7 (November, 1950).

The effect of glycerin in softening paper does not appear to be the result of humectant properties. At any relative humidity, the amount of water held by glycerin-treated sheets is less than the amount which would be held by the same amount of glycerin and cellulose separately. At low relative humidities, the amount of water held by glycerin-treated sheets is less than that held by untreated sheets alone. Glycerin does not soften paper solely because of its lubricating action. At low glycerin contents (up to 10%), the internal friction of paper sheets was found to be higher than that of untreated sheets. With high glycerin contents, the internal friction of the paper was decreased. In this region, fiber lubrication may play a significant role. Tensile strength measurements showed that the sheet becomes weakened with increasing glycerin content. The relationship between the tensile strength and the softness, as measured by flexural rigidity, was approximately linear. The observed softening is attributed to a corresponding weakening of the fiber bonding in the sheet. Both water and glycerin are effective softening agents. As an approximation, two molecules of water are equivalent to one molecule of glycerin in increasing softness as measured by flexural rigidity. The concept of the mechanism of paper softening, as developed in this work, has shifted the emphasis from the hygroscopic and lubricating properties of the softener to the more basic aspects of sheet structure and to the relationship of softness and fiber bonding. 3 tables, 7 figures, and 25 references.

E.S.

PLASTICS—PAPER-BASE

HOLOPLAST, LTD., *New Hythe, Maidstone, Kent.* Laminate panels for building construction. Brit. Plastics 23, no. 257: 126-9 (October, 1950).

Because of its high strength/weight ratio, Holoplast phenolic-impregnated paper laminate is finding extensive use in building construction. The material can be cut and drilled with normal woodworking machinery and lends itself to prefabrication techniques. When filled with suitable materials, the panels have excellent sound- and heat-insulating properties. Panels may be obtained in thicknesses from 1/16 to 1 5/8 in. Possible applications include office partitions, corridors, doors, and office and laboratory furniture. A special acoustical panel is also marketed which is a standard Holoplast laminate with one face perforated and with the cavities filled with scrim-covered kapok. A corrugated phenolic laminate, Corroplast, is also available for use in roofing and external cladding. Its advantages include strength, fire and vermin resistance, thermal insulation properties, and resistance to corrosive atmospheres. 15 illustrations. M.W.

SEIDEL, M. P. The mechanical properties of paper-base laminates. Tappi 33, no. 11: 549-51 (November, 1950); *cf.* B.I.P.C. 21: 186.

Phenolic resin-bonded laminates were made, using saturation-type papers of eight different commercial pulp stocks. These papers were of comparable thickness, high porosity, low density, and minimum grain. The properties studied were tensile, flexural, impact, and bond strengths. Significant differences caused by fiber orientation, length, and refining were observed. 2 tables, 5 figures, and 3 references. E.S.

SEIDEL, M. P., and RUNK, R. H. The moisture sorption and

dimensional stability of paper-base laminates. Tappi 33, no. 11: 551-3 (November, 1950).

The water resistance of eight paper stocks used as phenolic laminate fillers were evaluated. Properties tested on totally immersed samples were as follows: weight gain (moisture sorption), increase in thickness (at center and at edges), increase in length (with grain), and increase in width (cross grain). The results indicate that most samples had reached equilibrium in all three properties in about 30 days, with the exception of the two alpha papers on moisture sorption and increase in thickness. The superiority of southern and northern kraft in most properties tested is quite apparent and explains the wide use of these stocks in general-purpose paper laminates. 6 tables, 3 figures, and 3 references. E.S.

UNION CARBIDE AND CARBON CORPORATION. *Bakelite Division.* Advance in postforming. Bakelite Rev. 22, no. 3: 10-13 (October, 1950).

The process of postforming is essentially the reshaping of a cured, laminated sheet and involves the four steps of cutting, heating the material to a formable condition, shaping, and cooling. The laminates for postforming made by The Formica Co. are produced from fabric or paper stocks impregnated and laminated with Bakelite phenolic-resin varnishes for either industrial or decorative applications. The techniques for transforming the flat sheet to the finished article are outlined briefly; reference is made to the great variety of uses. 10 illustrations. E.S.

PLASTICS—PRINTING PLATES

FIELDING, L. Rubber plate moulding. Fibre Containers 35, no. 11: 80-1 (November, 1950).

A means of eliminating entrapped air in the molds used in the production of rubber plates for printing corrugated boxes is reported. Bakelite powder is used for this purpose, and has been found to give a deep impression and a good face; it is sufficiently porous to allow any air bubbles to escape. An outline of the molding procedure is given. A new type of plastic-impregnated paper carpet felt is also described, which gave excellent results in the first tests applied to molds. 1 figure. M.W.

POWER, HYDRO-ELECTRIC

EYTON, JOHN. Power and paper. Pulp Paper Mag. Can. 51, no. 11: 105-8 (October, 1950).

With reference to the modernization program of the Abitibi Power & Paper Co. which was started in 1946, the author discusses principally the electrical power requirements of the new groundwood mill at Iroquois Falls and the installations provided for meeting them. E.S.

PRINTING AND PRINTER'S INK

BUREAU, W. H. Paper and printing problems from the standpoint of the merchant and printer. Tappi 33, no. 11: 104-5A (November, 1950).

The author gives examples of general difficulties in the use of paper by the printer under the subdivisions of: the wrong paper selected for the job; lack of complete information concerning paper requirements; proper paper selected but actual delivery unsatisfactory; difficulties attributed to either printing operations or inks; and unexpected difficulties originating from an

unusual combination of circumstances. Possible remedies for these difficulties and the prevention of their occurrence are discussed. E.S.

MENNELL, P. B. Ink users' problems and their solution. Part 2. Paper Making and Paper Selling 69, no. 2: 13-14 (Summer, 1950); *cf.* B.I.P.C. 20: 738.

This article deals with ink problems involved in letterpress printing. Mottling, light-fastness, chemical resistance, problem of odor, printing plastic film, and machine-coated paper are discussed, and solutions to the problems they present are suggested. Although many ink users' problems can be solved at the machine, it is recommended that the ink be made for the special conditions under which it will be used. M.W.

REYNOLDS, AL. Adapting ink to paper. Share Your Knowledge Rev. 31, no. 11: 33-4 (September, 1950). [Reprinted from New England Printer (July, 1950)]

Ink must be selected for the paper rather than the paper for the ink. The lithographer can broaden his margin of safety between litho inks and paper previously considered unprintable by the process by purchasing inks with reduced tack. However, it is important that the ink manufacturer does the reducing while formulating the ink, and not the printer in the pressroom at a later stage. E.S.

RUNDELL, FORREST. Fit your illustration to the paper on which it prints. Inland Printer 126, no. 2: 38-9 (November, 1950).

To fit an illustration to the paper upon which it will be printed, the number of halftone dots used to reproduce the picture must be considered. Fine details are lost when a coarse screen is used, and stark drawings appear unfinished with fine screens and smooth-finish paper. To illustrate these points, reproductions of the same picture are shown, using four different size screens. 4 illustrations. M.W.

ST. JOHN, EUGENE. Buy the right ink for paper, process, press and job. Inland Printer 126, no. 1: 59-60 (October, 1950).

Ink is the least costly factor, about 3%, of the printing job; the best ink for the purpose should always be selected, and it should be the correct type for the paper, the process, the press, and the special requirements of the particular job. In order to obtain a suitable ink, the inkmaker should be consulted a few days before it is needed, because he requires about 72 hours to check on an order of a nonstock ink, as to how it will print and dry. Some of the important specifications that should accompany ink orders are: the end use of the printed piece; the type of press and printing process; the stock to be used, with samples; color specifications; order of sequence of colors; the use of transparent or opaque ink; and the time elapsed between printing the first and second sides and between different colors. E.S.

"VINETT." Obtaining that out-of-the-ordinary printing result. Paper Market: 94 (October, 1950).

An unusual paper can be used to achieve a different printing result. Among the papers which might be employed for this purpose are: rag, deckle-edged papers both wove and laid, Japanese vellum, glazed cartridge or plan paper, cover papers, pastel paper, "tea cartridges," and kraft papers. Vegetable parchment, greaseproof, and glassine may be used for insetting purposes, and unusual covers can be made from flints, foils, and metallic papers. M.W.

WEISER, DAVID R. Paper—in the service of the printer during the last sixty years. Am. Pressman 60, no. 3: 98-9,104 (February, 1950).

A review of the development in the technology of papermaking is given, and the parallel progress of the paper and printing industries is pointed out. 1 graph and 1 illustration. M.W.

WOODRUFF, A. B. Photo-lithography today. Brit. Printer 63, no. 375: 44-9 (November-December, 1950).

Following a brief history of lithography, the latest developments in the field are discussed. A description is given of various problems being studied (including the limitations of paper and the elimination of static electricity), and some of the new fields open to lithography are enumerated. 3 illustrations. M.W.

PULP

TOMLINSON, G. H. Recent trends in the manufacture of pulps as related to papermaking. Pulp Paper Mag. Can. 51, no. 11: 112-14 (October, 1950).

The author discusses the factors which affect the future availability (new cooking procedures and use of broadleaved species, wood waste, and straw) and cost (utilization of by-products, continuous digestion, etc.) of the pulps to the papermaker. With regard to quality, it would appear that startling differences are not likely to occur in the near future, although greater uniformity is to be expected. E.S.

PULP DRYING

LEGER, ADRIAN R. Sulphite pulp machines—Fourdrinier wet end operation. Pulp Paper Mag. Can. 51, no. 11: 101-2 (October, 1950).

Following an outline of the functions of the individual sections of the Fourdrinier wet end, the author discusses those factors which exert an influence on the operation and output of the Kamyr pulp drying machine, i.e., basis weight and temperature of the sheet on the wire, machine speed, operation of the press section, and drier capacity. These factors are closely interrelated. In order that the heaviest sheet possible be made on the wire section, the drier must have sufficient capacity to dry it to the desired moisture content; this is influenced by the entering moisture content of the sheet which, in turn, depends upon the operation of the presses. As far as the Fourdrinier section proper is concerned, the factors of prime importance in this respect are pond consistency, temperature of the water in the sheet, and the operation of the couch roll and suction boxes. The main difficulty encountered in the operation of a pulp drying machine, regardless of the type of wet end used, is the production of a sheet of uniform basis weight and moisture content in both machine and cross-machine directions. E.S.

TITTEMORE, C. R. Sulphite pulp machines—Cylinder wet end operation. Pulp Paper Mag. Can. 51, no. 11: 103-4 (October, 1950).

The author outlines the operating difficulties encountered with a cylinder-type wet-end and the steps taken to overcome these difficulties as the production rate was increased. E.S.

RADIOACTIVITY

FEARNSIDE, K. The use of isotopes in the paper industry. Part IV. Applications of the beta gauge. World's Paper Trade Rev. 134, no. 14: 939-40, 942, 944 (Oct. 26, 1950); *cf.* B.I.P.C. 21: 110.

In addition to its use in controlling the weight of a moving web of paper, the beta gage has other functions of interest to the paper industry. The following applications are discussed: (1) the measurement of relative amounts of moisture present between two parts of the papermaking machine; (2) the measurement of coating weight; and (3) the detection of joins or holes in paper which is to be cut into sheets. Two new types of beta gages are also described. One measures weight per unit area directly; the other depends on the backscattering of beta radiation and is called the reflection beta gage. The principle employed involves the dependence of the amount of reflected radiation on the atomic number and the thickness of the material it strikes. The advantages of this type of gage are its ability to measure paper weight when there is access to only one side of the paper, and its use in measuring thickness of coatings where the coating and backing differ in mean atomic number, or in measuring the thickness of paper or similar material on a roller or other metal backing during manufacture. 3 figures. M.W.

RAW MATERIALS

DOANE, FOSTER P., JR. Building a paper mill to use residual agricultural material. Southern Pulp Paper Manuf. 13, no. 11: 16, 20 (November, 1950).

The use of residual agricultural materials is not new; they were employed before wood pulp, and their use is bound to increase for two reasons: first, because of the increased use of paper and board, which requires additional amounts of raw materials which the forests cannot supply and, second, because of improved technical methods of harvesting, handling, and processing. A wide variety of fine and coarse papers, boards, and wallboards of good quality can be produced. In countries which do not have wood but which have straw, bagasse, or cottonstalks, a sound industry can be built up. Several mills which operate successfully are listed as proof. Straw pulp could be used as a substitute for sulfite in newsprint, but such a procedure is not practical. Newsprint mills are not located in straw-producing areas, so that the process would be too expensive. A 100% straw or bagasse newsprint sheet is not feasible, because such pulp cannot compete with wood pulp in price and does not give the required printing surface. However, it is inevitable that more mills will be designed and built to use residual agricultural materials in the near future, but in order to insure their success, a careful cost study must be made. E.S.

SPROULL, REAVIS C., METHVIN, LESLIE, and HARD, HERBERT G., JR. Kraft pulp from old crossties. Southern Pulp Paper Manuf. 13, no. 11: 38, 40 (November, 1950); Can. Pulp Paper Ind. 3, no. 12: 6-7, 30 (December, 1950).

Pulping experiments with old creosoted pine crossties at the Southern Research Institute are described. By the use of a mild kraft process, a good quality of pulp was obtained. Tear, burst, and freeness properties were similar to a standard commercial southern kraft made from new wood. The economics and potential uses of crosstie kraft are described; it is estimated that the cost of tiewood per ton of pulp would amount to approximately one half of that of fresh pulpwood. 1 table and 3 references. E.S.

RAYON—VISCOSE PROCESS

GONSALVES, V. E. A critical investigation on the viscose filtration process. Rec. trav. chim. 69, no. 7/8: 873-903 (July-August, 1950). [In English]

The author studied theoretically and experimentally the method used at present in practice for determining the clogging constant of viscoses, with particular reference to the work by Hermans and Bredée (*cf.* Rec. trav. chim. 54: 680-700 [1935]). He concludes that, in general, filtrations do not follow the standard law (1.5 power). For every type of filtration process, two constants have to be determined; their determination is difficult and time-consuming and, in most cases, not suitable for practical applications. In addition, the characterization of the course of the filtration process by two constants causes difficulties in comparing different viscoses, and the influence of the viscosity on the two constants is not known. 38 figures and 1 reference.
E.S.

NICOLAYSEN, V. B., and BERGH, W. Studies on the filtration of viscose. Norsk Skogind. 4, no. 8: 219-25 (August, 1950). [In English; Norwegian summary]

A brief review of recent work on the determination of the clogging constant, the mechanism of filtration, and the reasons for filter clogging is given, and shortcomings of the German standard method for determining the clogging constant under certain conditions are pointed out. In the present investigation, the authors studied the influence of the following factors on clogging: the viscosity of the viscose, the concentration of alkali in the viscose, the filtering pressure, and the porosity of the filtering medium; the sulfite pulp used was Borregaard Super VS. Their data indicate that clogging is the result of at least two different factors. One is the amount of undissolved particles and other solid impurities, which is the dominating factor in a poorly filtering viscose. As the particles are of different sizes, the clogging of such a viscose increases with decreasing pore diameter of the filtering medium. The other factor is connected with the inner structure of the viscose. The clogging caused by this factor increases as the rate of filtration increases, even with increasing pore diameter of the filtering medium. The simple relationship between the amount of alkali present in the viscose and clogging points to the possible effect which the electrostatic forces between submicroscopic particles or between molecules may exert. The phenomenon of streaming potentials has been assumed to be the reason for clogging in other types of filtrations; it may help to explain at least part of the problems in viscose filtrations. 2 tables, 11 figures, and 12 references.
E.S.

VOSTERS, H. L. Filterability of viscose. II. Svensk Papperstidn. 53, no. 19: 613-21 (Oct. 15, 1950). [In English; German and Swedish summaries] *cf.* B.I.P.C. 20: 660-1.

The author shows that the filtration of viscose follows the filtration law only when the filtration point is reached. The position of this filtration point varies and depends not only upon the swelling of the filtering medium, but also upon the quality of the viscose. A correction for these factors in the graphical determination of the clogging value is given. A practical method for the calculation of the clogging value with the help of statistical formulas is described. Several reasons for filter clogging and the quality of viscose during filtration are discussed, including the presence of reversible aggregates or that of high-polymeric cellulose in the viscose; steeping condition, period, and temperature; the presence of hemicelluloses in the steeping liquor; the

filtering pressure; the iron content of the steeping liquor; and the influence of the amount of carbon disulfide, xanthation time, and dissolving temperature. The considerable influence of some of these processing factors of viscose on the clogging value indicates that it is not possible to evaluate the filtering properties from the results of one or two experiments, but that rather a large number of investigations is required for finding the optimum conditions for good filtering of each type of viscose. 3 tables, 12 figures, and 32 references. E.S.

RESEARCH LABORATORIES

MONSANTO CHEMICAL COMPANY. Great American research laboratories. III. Barrell's Paper Annual, 1950-1951: 17-23 [1950] *cf.* B.I.P.C. 20: 38.

The activities of the different research laboratories of the company are described, which serve the paper industry in its many ramifications. 8 illustrations. E.S.

RESIN, SYNTHETIC

VAN NEDERVEEN, G. The application of synthetic resins in the paper industry. Papierwereld 4, no. 15: 266-8; no. 16: 286-9 (Feb. 15, March 1, 1950); V.I.-Pamphlet no. 23: 16 p. [1950] [In Dutch; English summary] *cf.* B.I.P.C. 19: 653.

Thermoplastic as well as thermosetting resins are used in the paper industry. The former are usually applied as coatings, the latter in the beater. Examples of different coating and laminating procedures are given. The beater application of thermosetting resins involves certain important problems, such as the bonding of the resin to the fiber, the location of the resin in the paper sheet, and the influence of beating. Photomicrographs are included which illustrate that melamine resin does not enter the fibers but is merely precipitated on them. 1 table, 15 figures, and 12 references. E.S.

WRIGHT, ROBERT E. [Packaging with polyethylene] Ind. Eng. Chem. 42, no. 11: 123-4A (November, 1950); *cf.* B.I.P.C. 21: 186.

The author discusses the use of polyethylene in packaging as a molded container, as a bonded coating for kraft paper for multiwall bags, as a liner bag for protecting fiber or metal containers, as a flame-sprayed coating for metal containers, and as a transparent film for small bags for food packages. 2 figures and 7 references. E.S.

SAFETY

BIENVENU, G. J. Safety as practiced in the container plants. Paper Ind. 32, no. 8: 904-7 (November, 1950). [Abridgment]

The safety program of the Container Division of Gaylord Container Corp. is outlined. E.S.

SALESMEN AND SALESMANSHIP

LAWLESS, H. C., JR. Which career? Am. Paper Merchant 47, no. 10: 20, 34-5; no. 11: 14, 43-5 (October, November, 1950).

A discussion of vocational choices is given in which the sales field and selling in the paper industry in particular receive special consideration. The history of the paper industry is reviewed, and statistics concerning the opportunities and salaries in this field are quoted. M.W.

SALT CAKE

ANON. North of the border. Chem. Inds. 67, no. 5: 748 (November, 1950); *cf.* B.I.P.C. 19: 348.

Four illustrations of the exploitation of the sodium sulfate deposits in Saskatchewan are given. E.S.

SEMI-CHEMICAL PULPING PROCESS

KELLER, E. L. Effect of bark in the neutral sulphite semichemical pulping of aspen, hickory, and slash pine. Tappi 33, no. 11: 556-60 (November, 1950).

Bark-free chips and mixtures of chips with up to 25% of bark by weight were pulped by the neutral sulfite semichemical process. With yields from the wood fiber in the 76 to 80% range, the yields from the bark were calculated to be 56, 52, and 35% for quaking aspen (*Populus tremuloides*), pignut hickory (*Carya glabra*), and slash pine (*Pinus caribaea*), respectively. The yield from the hickory bark was verified experimentally. During the impregnation stage of the digestions, slash pine bark absorbed twice as much sodium sulfite from the cooking liquor as was absorbed by an equal weight of wood, whereas aspen bark took up only slightly more than the corresponding wood, and hickory bark an intermediate amount. The inclusion of bark in amounts equivalent to the use of unpeeled wood required only slight changes in cooking conditions. With the exception of an increase in the folding endurance of the hickory pulps, the strength of standard test sheets decreased regularly with increasing amounts of bark. Folding strength was the most sensitive of the strength properties, the loss being 90% in one instance. Tearing resistance was least affected, with a maximum loss of 15%. The density of test sheets containing bark was low. The properties of the hickory pulps were little affected by the presence of bark, whereas aspen pulp lost seriously in strength and density. Slash pine bark had an intermediate effect. 3 tables, 3 figures, and 12 references. E.S.

SHIPPING CONTAINERS

BARGER, W. R. Refrigerated strawberry cases. Modern Packaging 24, no. 3: 125-6, 173, 175 (November, 1950).

A description is given of a new fiberboard container to be used for shipping strawberries in planes without refrigerated cargo compartments. The container holds four trays of berry boxes, and a fifth tray is used for dry ice, separated from the berries by a pad of crumpled tissue paper. Cleats at the bottom and sides provide air channels, and the dry ice used maintains a high carbon dioxide concentration. Results of tests on these containers are summarized in a series of tables and diagrams. 2 tables and 5 figures. M.W.

OAS, R. E. Corrugated boxes. Fibre Containers 35, no. 11: 77-8 (November, 1950).

A description is given of Package 210, the Standard Parts Box. It is fabricated from kraft corrugated board and consists of a stitched inner regular slotted container and two stitched outer reinforcing covers which are placed over the container and meet at the middle of the box. The package, with a minimum weight limit of 260 pounds, is metal strapped. It has proved to be very successful for the bulk shipment of nuts, bolts, screws, and other fastenings. Its advantages include economy, standard sizes, light weight, ease of filling, safety, and better protection of contents. M.W.

TAYLOR, C. E. Solid fibre boxes. Fibre Containers 35, no. 11: 78 (November, 1950).

Some new uses for solid fiber boxes are mentioned, including containers for iced meat and poultry, hardware, and beverages. M.W.

SHIPPING CONTAINERS—AIR FREIGHT

BARUH, M. R. Air freight packaging. Boxboard Containers 68, no. 695: 28, 34 (November, 1950).

Paperboard containers have proved to be most satisfactory for air shipment; however, package standardizations are needed for further progress in this field. Requirements and desired improvements for air-freight containers are discussed, and the advantages of kraft liners are described. M.W.

SHIPPING CONTAINERS—TESTING

AREND, A. G. Testing containers and packaging materials. Brit. Packer 12, no. 10: 41 (October, 1950).

A brief review is given of tests which simulate the actual conditions under which containers are used. The tests which are used on paper to determine bacteriological properties and resistance to staining are described. Mention is also made of improvements in folding-strength tests for board material, and the means for testing gas porosity or permeability. M.W.

SLIME PREVENTION

KIRCHEN, CHARLES P. The relationship between increased re-use of paper machine white water and slime control. Paper Ind. 31, no. 9: 1126-8 (December, 1949). [Abridgment]

The process of closing up a paper machine system consists of replacing fresh water with white water, whenever it can be done without impairing the operation of the papermaking process. The author describes methods for clarifying the white water from kraft mill operations prior to re-use and stresses the importance of the conservation of fresh water, heat, and chemicals. Reference is made to the microbiological aspects of filtered white water which are equally as important as the mechanical aspects. The investigation and evaluation of an efficient slime-control program should receive the identical attention as the selection and operation of the saveall. The value of slime-measuring units for following the trend of slime accretion is pointed out. Slime control in kraft pulp mills does not usually present as much of a problem as in groundwood, sulfite, or semichemical operations. E.S.

SODA ASH

SKEEN, JOHN R. Soda ash. Chem. Eng. 57, no. 11: 325-6, 328 (November, 1950).

A commodity survey of soda ash is presented. During the summer of 1950, the outbreak of the Korean War and a series of strikes curtailed production to the extent that a serious deficit of the chemical was created. Actual loss in production totaled 600,000 tons. Although military demands remain uncertain, the strikes are settled for a three-year period, and within a few months the shortage may be alleviated. Production, consumption, and capacity figures are summarized in a series of tables. 5 tables and 1 flowsheet. M.W.

SODA MILLS

ANON. Mead's Kingsport Division soda mill modernized. Paper Ind. 32, no. 8: 831-4, 837 (November, 1950).

An illustrated description of the recently completed modernization program of the Kingsport Division of The Mead Corp., Kingsport, Tenn. is given. It involved the building of a lime kiln, the installation of six modern pulp digesters with auxiliaries, a new soda recovery furnace, the installation of fly ash collectors on the boilers, and improvements in the mill ventilating system. Special attention was paid to the reduction of stream and air pollution. 9 illustrations. E.S.

SODIUM CHLORITE

HOLST, GUSTAF. Production of sodium chlorite; survey of prevalent manufacturing methods. Ind. Eng. Chem. 42, no. 11: 2359-71 (November, 1950).

A detailed electrochemical and thermodynamic analysis has been made of the various reactions involved in the reduction of chlorine dioxide to produce sodium chlorite. This has led to a choice of lead oxide as the most suitable reducing agent available. An experimental study has been made of the lead oxide process, which has proved to give excellent yields of sodium chlorite, together with a valuable co-product, lead dioxide. The favorable economics of the process should be of decisive importance in further technical developments. 3 tables, 9 figures, and 34 references. E.S.

STARCH

HELLMAN, N. N., and MELVIN, E. H. Surface area of starch and its role in water sorption. J. Am. Chem. Soc. 72, no. 11: 5186-8 (November, 1950).

The surface area of dasheen, corn, tapioca, and potato starches available to nitrogen at —195°C. was found to be 2.62, 0.70, 0.28 and 0.11 sq. m./g., respectively. The interpretation of the water-sorption isotherms of these four starches by the Brunauer, Emmett, and Teller equation (*cf.* J. Am. Chem. Soc. 60: 309-19 [1938]) requires surface areas of 330, 334, 348, and 422 sq. m./g., respectively. It was concluded that the nitrogen-available surface area of starch does not give a quantitative explanation of the water-sorptive capacity of starches of different botanical origin. The apparent external surface area of these starches was also determined photomicrographically and found to be in close agreement with the nitrogen-available surface area. 3 tables, 1 diagram, and 10 footnotes. E.S.

WOLFF, IVAN A., GUNDRUM, LAETTA J., and RIST, C. E. A simplified procedure for the characterization of starch fractions by viscosity and iodine sorption. J. Am. Chem. Soc. 72, no. 11: 5188-91 (November, 1950).

A simplified procedure is presented for determining the intrinsic viscosity and iodine affinity of a starch fraction. Equations are given for estimating accurately the intrinsic viscosities of amyloses and amylopectins in 1 *N* potassium hydroxide solution from relative viscosities taken at 0.2% concentration. Iodine affinities of these same alkaline solutions are determined potentiometrically, to measure the proportion of linear material in the starch fractions. Experimental data are presented illustrating the validity of the procedure. 1 table, 2 figures, and 9 footnotes. E.S.

STATIC ELECTRICITY IN PAPER

APPLEBY, W. J. Static electricity, its nature and method of elimination. Brit. Printer 63, no. 375: 54-6 (November-December, 1950).

The nature of static electricity and some devices used for its elimination are described. Eliminators are of two types: the radioactive, self-energizing type and the electric neutralizer. The advantages of each type are discussed, and the characteristics of some commercially available installations are outlined. 3 illustrations. M.W.

BALDWIN INSTRUMENT CO. LTD., *Dartford.* A device for measuring static. Brit. Printer 63, no. 375: 56 (November-December, 1950).

A device, called the "Statigun," has been developed for measuring static electricity. It measures voltage gradients and discriminates between fixed positive and negative potentials and alternating potentials. The instrument is self-contained, battery-operated, and designed for use by nonscientific personnel. 1 illustration. M.W.

STEAM POWER

PERRY, JOSEPH A., JR. Increased productivity through automatic combustion control. Paper Trade J. 131, no. 18: 24-6, 28 (Nov. 2, 1950).

The author discusses the functions of a combustion-control system and the fundamentals of several arrangements of combustion-control equipment. Although all such systems have a common purpose and work on the same basic principle, each system must be engineered in detail for the particular set of operating requirements involved. 6 figures. E.S.

STREAM POLLUTION

CRAWFORD, S. C. Mill operations from stream pollution point of view. Southern Pulp Paper Manuf. 13, no. 11: 40-1 (November, 1950).

The author discusses the managerial responsibility in the correction of stream pollution and emphasizes the need for minimizing wastes in mill operations through the co-operation of the production and technical men. E.S.

DOUDOROFF, PETER, and KATZ, MAX. Critical review of literature on the toxicity of industrial wastes and their components to fish. I. Alkalies, acids, and inorganic gases. Sewage Ind. Wastes 22, no. 11: 1432-58 (November, 1950).

The authors review the more recent literature on the subject; publications more than 25 years old are summarized and discussed only if considered exceptionally important. 126 references. E.S.

MOGGIO, W. A., and GEHM, H. W. Biological treatment of kraft mill wastes. Sewage Ind. Wastes 22, no. 10: 1326-37 (October, 1950).

A report of laboratory studies on the acceleration of the biochemical process involved in the oxidation of kraft mill wastes is given. Fortifying

the mill waste with nitrogen and phosphate salts and seeding with organisms from the mill wastes diminished the amount of aeration necessary and hastened the rate at which B.O.D. removals were obtained. Aerobic organisms from domestic sewage proved to be as effective in the oxidation as those from the kraft waste itself. For short periods of aeration (eight hours or less), the rate of B.O.D. removal was only slightly less than with longer periods (24 hours). Suspended solids concentrations were important in the rate of oxidation; increased concentration of solids resulted in a greater rate of B.O.D. removal. 5 figures, 15 tables, and 5 references. M.W.

SUGARS

SUNDMAN, JACOBUS. Fructose units in wood. Paper and Timber (Finland) 32, no. 10: 306-8 (October, 1950). [In Swedish; English summary]

The literature on sugar units found in wood polysaccharides includes fructose residues, as well as the usual glucose, mannose, xylose, arabinose, and galactose units. The presence of fructose, however, has never been proved conclusively. The present work makes a thorough study of methods used in determining fructose units in wood and in pulp. It was shown that methods previously used to hydrolyze the polysaccharides in wood were so drastic that 50-70% of any pre-existing fructose would have been destroyed; on the other hand, the sugar could actually be formed by epimerization from glucose and mannose during an analysis. A new method was devised whereby the hydrolysis was carried out under milder conditions and epimerization was avoided. When this technique was then applied to spruce-, pine-, and birchwood, spruce holocellulose, and rayon and paper pulps made from spruce, the new method showed that none of these materials contained fructose units. 2 tables, 1 diagram, and 15 references. L.E.W.

SULFATE MILLS

ANON. Dissolving pulps by sulfate process. Chem. Inds. 67, no. 4: 576-7 (October, 1950); *cf.* B.I.P.C. 21: 117.

A brief description is given of the processes used at the new Natchez mill of International Paper Co., which is the first dissolving-pulp mill in the South designed to utilize hardwoods by means of the sulfate process. 9 illustrations. M.W.

PULP & PAPER. Natchez uses gum 100%. Pulp & Paper 24, no. 12: 66, 68-9 (November, 1950); *cf.* B.I.P.C. 21: 117.

A brief, illustrated description of the equipment and sequence of operations at the new sulfate mill at Natchez is given. 8 illustrations. E.S.

SULFITE WASTE LIQUOR

PEARL, IRWIN A., and BEYER, DONALD L. Studies on lignin and related products. VI. The oxidation of fermented sulphite spent liquor with cupric oxide under pressure. Tappi 33, no. 11: 544-8 (November, 1950); *cf.* B.I.P.C. 21: 195.

A series of experiments was made on the oxidation of *Torulopsis utilis*-fermented sulfite waste liquor with copper hydrate and alkali under pressure at elevated temperatures. Variables considered were molar ratio of copper hydrate to lignin, molar ratio of caustic to lignin, time, and temperature. Total yields of ether-soluble material and of vanillin were determined for each set of conditions. For purposes of this investigation, the unit molecular

weight of lignin was defined as that weight which contains one methoxyl group, assuming that lignin contains 14.5% methoxyl. Thus, the unit molecular weight becomes 214. Yields of total guaiacyl products pass through a maximum at a sodium hydroxide-lignin molar ratio of approximately 12. The corresponding vanillin yields on the lignin basis are a maximum when the sodium hydroxide-lignin ratio is about 13. Highest yields were obtained with a copper hydrate-lignin ratio of 13.5. 10 figures and 8 references. E.S.

ROGERS, C. E., and JOLLEY, R. S. Burning of calcium base sulfite liquor without auxiliary fuel. Paper Trade J. 131, no. 20: 25-6, 28-30 (Nov. 16, 1950); Pulp & Paper 25, no. 1: 66, 68, 70, 72, 91 (January, 1951).

Experiments with the firing of concentrated sulfite waste liquor of 62.7% solids in an existing Stirling boiler in the power plant of the Consolidated Water Power and Paper Co. at Appleton, Wis. demonstrated conclusively that calcium-base sulfite waste liquor can be burned in a practical manner in a properly designed boiler unit without the necessity of firing in conjunction with an auxiliary fuel. Suggestions are given for certain features which should be incorporated in any commercial heat-recovery unit for this purpose: the liquor should be sprayed in a U-shaped pattern; a properly designed refractory furnace should be provided; a gas air heater is essential for maintaining the combustion air at relatively high temperatures; steam atomizing burners are satisfactory for atomizing the liquor for good suspension burning; and the liquor should be maintained at elevated temperatures for satisfactory firing, preferably without excessive dilution. Two arrangements of boiler units which incorporate these suggestions are outlined, one the conversion of an existing boiler and the other the construction of a new unit. 5 tables and 8 diagrams. E.S.

SULFUR

LUNDY, W. T. Known potential sulfur resources of the world. Ind. Eng. Chem. 42, no. 11: 2199-201 (November, 1950).

The forms in which sulfur is commonly found include native sulfur, sulfides of many metals, natural sulfates, and sulfide gases associated with natural gas and petroleum. Sulfur in some form has been recovered from all these sources. At present the salt dome deposits of the Gulf Coast region of Texas and Louisiana are the principal source. Other native sulfur deposits include those of Italy and Sicily as well as the volcanic type found in many countries of the world. Pyrites have long been an important source of sulfur, owing to ample supplies and world-wide occurrences of deposits. Sulfur is produced as a by-product of numerous industries and the amount will undoubtedly increase in the future. In recent years plants have been installed in the United States to recover sulfur in elemental form from sour gases. Natural sulfates are not an important source at present. The known and potential resources of sulfur of the world are sufficient to meet all requirements for many years. 40 references. E.S.

SULFUR DIOXIDE

FLEMING, EDWARD P., and FITT, T. CLEON. Liquid sulfur dioxide from waste smelter gases; use of dimethylaniline as absorbant. Ind. Eng. Chem. 42, no. 11: 2253-8 (November, 1950).

Following a brief review of the processes developed in Europe for producing liquid sulfur dioxide from waste smelter gas, the ASARCO process (developed by the American Smelting and Refining Co., San Francisco, Calif.)

is outlined, in which anhydrous dimethylaniline is used as an absorbent. The novel features of the process and construction details are described by reference to the flowsheet of the 20-ton plant installed in 1947 in the company's lead smelter at Selby, Calif. The possibilities are mentioned for applying the process to the recovery of sulfur dioxide from low-grade industrial gas by the use of other reagents having a high absorptive capacity for the gas. 5 figures and 9 references. E.S.

SURFACE PHENOMENA

FARADAY SOCIETY. Interaction of water and porous materials. Discussions Faraday Soc. no. 3: 5-129 (1948).

The first section of this discussion deals with the fundamental aspects of the problem; the following articles, listed by authors and titles only, may be of general interest to the industry: Adam, N. K. Principles of penetration of liquids into solids—17 references, p. 5-11; Cassie, A. B. D. Contact angles—10 references, p. 11-16; Shuttleworth, R., and Bailey, G. L. J. The spreading of a liquid over a rough solid—6 references, p. 16-22; Hirst, W. The mechanical interaction between mobile insoluble adsorbed films, capillary condensed liquid and fine-structured solids—10 references, p. 22-8; Foster, A. Graham. Pore size and pore distribution—26 references, p. 41-51; Schofield, R. K., and Talibuddin, O. Measurement of internal surface by negative adsorption—5 references, p. 51-6; Schofield, R. K., and Dakshinamurti, C. Ionic diffusion and electrical conductivity in sands and clays —1 reference, p. 56-61; Barrer, R. M. Fluid flow in porous media—29 references, p. 61-72; Carmen, P. C. Some physical aspects of water flow in porous media (see abstract, p. 238). E.S.

TALL OIL

BERNSTEIN, I. M. Drying oils in printing inks. J. Am. Oil Chemists' Soc. 27, no. 11: 534-8 (November, 1950).

In a general analysis of the natural and synthetic drying oils used in the printing-ink industry, reference is made to the fact that tall oil is also employed, but in relatively small quantities. 2 tables and 7 references. E.S.

CARRICK, L. L. Vegetable oil paints. J. Am. Oil Chemists' Soc. 27, no. 11: 513-22 (November, 1950).

The author discusses individually the application of different natural oils to paints and the characteristics of the resulting films. A brief discussion on tall oil is included (p. 520); at present it is principally used in the more inexpensive paints. 61 references. E.S.

KAJANNE, PAAVO. On the composition of the fatty acids of pine wood extract and tall oil; a spectrophotometric investigation. Acta Chem. Scand. 4, no. 7: 1147-9 (1950). [In English]

Based on ultraviolet absorption, the author concludes that the fatty acids of *Pinus silvestris* (grown in Finland) contain an acid with four double bonds, and that during the kraft cook, this tetraene system is converted into a triene system appearing in the spectrum as linolenic acid. Probably diene systems are found at the same time. Finnish tall oil evidently does not contain linolenic acid. This is a preliminary communication, the details of which will be published later. 1 figure and 6 references. L.E.W.

TALL OIL ASSOCIATION. Tall oil in core oils. Tall Oil in Ind. Bull. no. 7: 4 p. (October, 1950); *cf.* B.I.P.C. 20: 435.

Following a brief outline of core requirements and the substances used as core binders (water-solubles, pastes, colloids, gums and pitches, rubbers,

resins, and drying oils), the application of tall oil esters as core oils is described. They are prepared by cooking tall oil with glycerol or other polyhydric alcohols in closed stainless-steel kettles at about 530°F. for several hours, until the desired degree of esterification is obtained. Metallic soap driers and thinners may be added, as desired. The tall oil ester may be used alone as a core oil after suitable thinning, or the ester may be blended with other drying oils. It is possible that even less expensive forms of tall oil, such as limed or blown tall oils, may be developed in grades suitable for core oils. 5 references. E.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

BLEGEN, JAMES R. Flammability measurements on thin sheet materials and fabrics. Gen. Elec. Rev. 53, no. 10: 9-12 (October, 1950).

A description is given of a new type of flammability tester for plastic materials, textiles, rubber, and paper. The tester consists of a steel cabinet which serves as a draft shield and as a mount for a 45°-rack and vertical holder, flame jets, a manometer, a pyrometer, and an instrument panel on which operating switches and timing clocks are mounted. In the testing process, ignition time, time of burning, and intensity of burning are obtained automatically from one sample. Special provisions are included for testing materials with abnormal burning properties. The work has been standardized, utilizing c.p. butane as the fuel, and reproducible results are obtained. 1 figure. M.W.

TROMMER, CHARLES R. A method of measuring penetration and wetting. Am. Dyestuff Reptr. 39, no. 24: P811-12, P830 (Nov. 27, 1950).

The author describes an apparatus and experimental technique by which he attempts to separate the phenomenon of the surface wetting of textiles from the penetration of textiles by a wetting solution. The apparatus is at present in a crude form but will be refined when sufficient data have been obtained to permit a more complete appraisal of its applicability. Possible uses for the technique include the evaluation of commercial penetrants for money value, the determinations of water repellency separate from air permeability, and the correlation between penetration of a dye assistant and penetration of a dye itself. 4 references. M.W.

TRACE ELEMENTS

HEINZELMAN, D. C., and O'CONNOR, R. T. Trace metals in cotton fiber. Textile Research J. 20, no. 11: 805-7 (November, 1950).

The lint of eight varieties of cotton grown in one location and of one variety grown in 13 locations was analyzed for trace metals by the line-width method of spectrochemical analysis to provide composition data on the presence of metals which are known to catalyze the degradation of cotton cellulose. Modifications were made in the line-width method of spectrochemical analysis as previously applied to vegetable oils to make it more applicable to cotton fiber. The highest, lowest, and average values, calculated on a moisture-free basis, for copper, iron, and manganese were 4.01, 0.68, and 1.57; 13.77, 3.74, and 9.03; and 12.39, 2.79, and 6.92 parts per million, respectively. Although some of the variation is attributed to varietal characteristics, the greater part is attributed to soil environment. The spectrograms showed the presence of aluminum, boron, and zinc in trace amounts in all cases, but they did not reveal the presence of chromium, nickel, or tin. 2 tables and 7 references. E.S.

TRANSPARENT CONTAINERS

TRANSPARENT FABRICATORS INC., *New York.* A fully automatic plastic box operation. Boxboard Containers 68, no. 695: 15, 69 (November, 1950).

Although in business only a few months, Transparent Fabricators is setting new standards for the packaging industry. The firm is engaged in manufacturing and designing rectangular plastic boxes made of acetate sheet film. Its success is largely the result of an exclusively designed and specially developed fabricating machine which automatically feeds rolls of film, cuts the acetate to exact box size, creases and beads the edges, and ejects a finished product in record time. For the time being the machine will not be made available to other companies. M.W.

TURPENTINE

HASSELSTROM, TORSTEN, BALMER, CLIFFORD E., KENNEDY, NORENE E., and COLES, HAROLD W. Some terpene carboxy esters from turpentine; their synthesis from crude sulphate turpentine and other sources and their preliminary evaluation as plasticizers. Tappi 33, no. 11: 538-41 (November, 1950).

The compounds selected for investigation included certain esters of *d*-camphoric acid (I), camphenic acid (II), pinonic acid (III), and camphenonic acid (IV); their preparation is described, including the use of crude sulfate turpentine as a raw material for (III). The testing of the plasticizing action of the compounds was confined to the determination of compatibilities with selected high polymers, flexibilizing properties at low temperatures, and fungistatic activity. The results are presented in tabular form. All esters used were found to be compatible with the cellulose esters tested, with the exception of the *n*-hexyl esters of (I) and (II), which caused blooming in acetate films in low concentrations. In polyvinyl butyral films, the terpene carboxy esters were as efficient as the commercial phthalate plasticizer used as a blank. When incorporated in polystyrene films in a 1:3 ratio, they showed the same behavior as *n*-butyl sebacate, but produced less flexibility than the commercial product in lower concentrations. The *n*-hexyl esters of *dl*-pinonic acid exerted a fungistatic action similar to that of benzoic and salicylic acids. The slight difference in plasticizer behavior between esters of (III) prepared from α-pinene and crude sulfate turpentine is attributed to the presence of esters of anisic and dehydrocumic acids in the latter. 7 tables and 9 references. E.S.

WASTE GAS

REED, ROBERT M., and UPDEGRAFF, NORMAN C. Removal of hydrogen sulfide from industrial gases. Ind. Eng. Chem. 42, no. 11: 2269-77 (November, 1950).

The removal of hydrogen sulfide from natural and manufactured gases has become of great importance in recent years because of more rigid specifications for pipe-line distribution, higher sulfur content in raw materials, and the depletion rate of mineral sulfur deposits. The authors review the various commercial processes used for this purpose. The only dry process in extensive use is the iron oxide process, largely used by utility companies for purification of city gas. The wet processes used fall in the following classifications: nonregenerative processes, including caustic soda, lime slurry, potassium permanganate, and bichromate-zinc sulfate; regenerative nonrecovery processes (the only process in commercial use in this classification is the Seaboard process); regenerative processes with recovery as hydrogen

sulfide, including vacuum carbonate, Girbotol, phosphate, Alkazid, and phenolate; and regenerative processes with recovery as sulfur (the principal process used here is the Thylox process; the earlier Ferrox and nickel processes are now becoming obsolete). Various processes are selective in varying degrees for the removal of hydrogen sulfide in the presence of carbon dioxide. Potassium permanganate and bichromate-zinc sulfate processes may be used for the removal of small quantities of hydrogen sulfide. Manufactured gas may be purified by the use of iron oxide, Seaboard, vacuum carbonate, and Thylox processes, which are highly selective. Natural and refinery gases may be treated with the Girbotol process using the tertiary amine, the phosphate process, or the Alkazid Dik solution for semi-selective removal of hydrogen sulfide. 8 figures and 34 references. E.S.

WASTE PAPER

SAVERY, RANALD. Contract plan of New York printers group builds income from waste paper. Inland Printer 126, no. 2: 33-4 (November, 1950).

Group marketing of waste paper by means of a centralized plan of operation is cited as another example of the advantages that can result when printers act co-operatively to solve industry problems. The program developed by the New York Employing Printers Association is described, whereby a group of printers has an arrangement with a dealer in waste material. The plan is worked out in such a manner that the service is scaled to the requirements of the individual printers. The benefits to members include: assurance of receiving market prices for waste paper, pick-up service geared to the needs of the firms, and proper segregation to assure maximum revenue. M.W.

WAXES

JONES, DONALD T. Paraffin and microcrystalline waxes. Soap Sanit. Chemicals 26, no. 11: 125, 127 (November, 1950).

Oil-free paraffin wax is now being obtained by solvent dewaxing of the wax distillate and by emulsification and centrifugation of the slack wax. The crystalline-type wax consists principally of saturated straight-chain hydrocarbons with minute amounts of unsaturates. Physical properties affecting the wax value include: melting point, tensile strength, oil, hardness, and color. The crystal formation of paraffin is that of needles, plates, malcrystals, or a mixture of these. Microcrystalline wax consists of microscopic crystals of no definite shape, and is distinguished from paraffin by its inherent toughness and outstanding tensile strength and flexibility characteristics. The method of obtaining it from crude is described. Two types of micro waxes are the ductile, flexible, and tacky type employed as a laminant, and the relatively oil-free material used in liquid polishes. Microcrystalline waxes generally have more oil than paraffin waxes and are able to absorb considerable oil with exceptional retentiveness. The addition of relatively small amounts of microcrystalline wax to paraffin will raise the refractive index considerably. It is possible that microcrystalline wax can be substituted for many natural waxes, and paraffin, micro, and polyethylene resin blends have been used. The physical properties of paraffin and microcrystalline waxes, and paraffin to which micro wax has been added are shown in tabular form. 2 tables and 2 references. M.W.

MARSEL, CHARLES J. Waxes; types, production, properties, uses. Chem. Inds. 67, no. 4: 563-74 (October, 1950).

The author reviews the current technology of natural waxes (plant and animal), petroleum, mineral, and synthetic waxes, and wax blends. The source, physical properties, and uses of various waxes in each class are de-

scribed. A lengthy table which includes the grades, properties, principal uses, and manufacturers of commercial waxes is appended. 2 tables, 4 illustrations, and 15 references. M.W.

WET STRENGTH

GRUNTFEST, I. J. Retention of wet-strength additives in paper. Tappi 33, no. 11: 529-30 (November, 1950).

The design and application of urea-formaldehyde resins for the manufacture of wet-strength paper are discussed in such a way as to emphasize the similarities of this process with those of sizing, filling, and dyeing of paper with wet-end additives. In particular, the importance of the ion-exchange capacity of the various pulps and the ionic character of the resins is considered. 2 figures and 9 references. E.S.

IZARD, EMMETTE F. Polymer containing free aldehyde groups. Ind. Eng. Chem. 42, no. 10: 2108-10 (October, 1950).

Copolymerization of vinyl acetate and allylidene diacetate proceeds smoothly to yield a product which on alkaline alcoholysis is converted to a water-soluble product containing both free hydroxyl and aldehyde groups. This product may be applied to various substances, such as paper and fabric, from aqueous solution, and then be converted to water-insoluble form by heating or by aftertreatment by a mild acid catalyst. Such products are still sufficiently water-sensitive to serve as a permanent size or finish on the fabric or paper. The wet strength of paper is materially increased by such treatment. Pigments or other substances may be anchored to the surface of paper or fabrics to produce either solid colors or printed effects. 1 table and 5 references. E.S.

WHITE WATER

ANON. Reuse of water by the OCO water system. Southern Pulp Paper Manuf. 13, no. 11: 20, 22 (November, 1950); Paper Mill News 73, no. 46: 112, 128 (Nov. 18, 1950); Paper Ind. 32, no. 9: 957-8 (December, 1950); Tappi 33, no. 12: 95-6A (December, 1950); *cf.* B.I.P.C. 20: 912.

The development and operation of the OCO water system are outlined. E.S.

WOOD—EXTRACTIVES

LINDSTEDT, GÖSTA. Constituents of pine heartwood. XXII. The isolation of pinostrobin and 3,5-dihydroxy-7-methoxy-flavanone from the heartwood of *Pinus clausa* Vasey. Acta Chem. Scand. 4, no. 7: 1042-6 (1950). [In English] *cf.* B.I.P.C. 20: 914-15.

From one sample of heartwood from *Pinus clausa* Vasey, pinostrobin (5-hydroxy-7-methoxyflavanone) and a new substance have been isolated. The latter substance is identical with pinobanksin 7-methyl ether (3,5-dihydroxy-7-methoxyflavanone) and can be dehydrogenated to izalpinin (3,5-dihydroxy-7-methoxyflavone). The two substances were detected with the aid of paper chromatography. Other samples of *Pinus clausa* did not contain these substances. 6 references. E.S.

WOOD—MENSURATION

CHAMBERLAIN, EVERETT B., and MEYER, H. ARTHUR. Bark volume in cordwood. Tappi 33, no. 11: 554-5 (November, 1950).

A simple procedure is given for the calculation of bark volume in cordwood on the basis of average bark thickness measured with bark gages. 3 tables, 2 figures, and 2 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALKALINE PROCESSES

FARBER, EDUARD. Alkaline sulfite digestion of hardwood. U. S. patent 2,528,349. Filed Feb. 27, 1945. Issued Oct. 31, 1950. 3 claims. Assigned to Hardwood By-Products, Inc. [Cl 92-13]

A process for the extraction of hemicelluloses, lignin, pentosans, and similar bonding agents from hardwood to produce a pulp consists in subjecting hardwood particles, at atmospheric pressure and 40°C., to the action of an aqueous solution which contains 0.5% by weight of both sodium hydroxide and sodium sulfite. E.G.S.

FARBER, EDUARD. Alkaline sulfite digestion of hardwood. U. S. patent 2,528,351. Filed Aug. 17, 1950. Issued Oct. 31, 1950. 2 claims. Assigned to Hardwood By-Products, Inc. [Cl. 92-13]

A process for the removal of bonding agents such as lignin from hardwoods which have hemicellulose contents of at least 18% (e.g., poplar, oak, maple, gum, walnut, etc.) comprises the digestion of the hardwood particles at atmospheric pressure and 55-75°C. for one to two hours in a solution of 1-4% sodium hydroxide and 0.4-2.5% sodium sulfite. E.G.S.

FARBER, EDUARD. Two-step digestion of hardwoods. U. S. patent 2,528,350. Filed June 5, 1947. Issued Oct. 31, 1950. 4 claims. Assigned to Hardwood By-Products, Inc. [Cl. 92-13]

A two-step process for the digestion of hardwoods which have a hemicellulose content of at least 18% (e.g., poplar, oak, maple, gum, walnut, etc.) comprises the digestion of the hardwood particles for one to two hours at 15-30°C. in a 0.4-2.5% aqueous sodium sulfite solution, followed by the digestion of the particles for one to two hours at 70-80° in a 1-4% aqueous sodium hydroxide solution. The entire process is carried out at atmospheric pressure. E.G.S.

ALKALINE PROCESSES—FURNACES

DALIN, DAVID. Recovery methods and furnace apparatus there-

for. Canadian patent 469,127. Filed July 27, 1946. Issued Nov. 7, 1950. 4 claims.

A black liquor-recovery furnace incorporates heat-exchange members which are loosely mounted or supported in the path of the combustion gases so as to offer a surface for the impingement of the gas-entrained fly ash or soot; the heat-exchange surfaces are agitated or shaken periodically to dislodge the adhering ash and soot particles. It is contemplated that the fly ash which does not adhere to the heat-exchange members will be frozen and that, as a result, its tendency to stick to subsequently encountered surfaces will be reduced. 4 figures. E.G.S.

HAMM, ALEXANDER L. Chemical recovery furnaces with high temperature superheaters. Canadian patent 469,051. Filed Jan. 19, 1948. Issued Oct. 31, 1950. 7 claims. Assigned to Combustion Engineering-Superheater, Inc.

A high-temperature superheater is designed to be used in conjunction with a sulfate-recovery furnace. According to the invention, it is possible to accomplish a relatively close equalization of the temperatures of the combustion products entering the superheater tubes, across the entire cross-sectional area of the furnace, and thus to obtain a relatively high average temperature of the products entering the superheater. The temperature of the superheater tubes is reduced, and thereby the amount of salts deposited on the tubes is diminished. The temperature of superheat is controlled independently of the operation of the sulfate furnace. 2 figures. E.G.S.

BLEACHING

DARBYSHIRE, RICHARD W. Precipitation of basic calcium hypochlorite. Canadian patent 469,604. Filed Sept. 13, 1946. Issued Nov. 21, 1950. 5 claims. Assigned to Wyandotte Chemicals Corporation.

A process for the manufacture of a high-test bleach includes the steps of reacting an ascending solution of calcium hypochlorite and calcium chloride with a caustic soda solution of greater density, thus forming solid basic calcium hypochlorite; permitting the basic hypochlorite to settle through an additional quantity of unreacted ascending solution of calcium hypochlorite and calcium chloride to free it from the liquid phase resulting from the first-mentioned reaction step; and withdrawing the solid basic calcium hypochlorite from the system as a slurry in some of the unreacted hypochlorite and chloride solution. 5 figures. E.G.S.

BLEACHING—SEMICHEMICAL PULP

MCEWEN, ROBERT L. Method of bleaching semichemical pulps. U. S. patent 2,527,563. Filed Aug. 13, 1947. Issued Oct. 31, 1950. 1 claim. Assigned to Buffalo Electro-Chemical Company, Inc. [Cl. 8-106]

This corresponds to Canadian patent 460,244; *cf.* B.I.P.C. 20: 213. E.G.S.

BOARD, ASBESTOS

WAECHTER, OTTO H. Treatment of fibro-cement products. U. S. patent 2,531,016. Filed Sept. 15, 1945. Issued Nov. 21, 1950. 3 claims. [Cl. 92-41; changed to 92-68]

A process of treating asbestos-cement products comprises the steps of

continuously and successively advancing a series of cut, freshly formed, laminated asbestos-cement sheets which have a moisture content of 22-35% by weight through a heating zone to condition the sheets for pressing by heating the sheets sufficiently to reduce the moisture content of the outer laminations to about 15% by weight, then passing the sheets through a cooling zone which is maintained at room temperature, and finally subjecting the cooled, moisture-conditioned sheets to pressure to form a densified asbestos-cement product. 1 figure. E.G.S.

BOARD SPECIALTIES

BUDD, LARRY J. Method of making pallets. U. S. patent 2,528,413. Filed July 14, 1948. Issued Oct. 31, 1950. 9 claims. Assigned to Pallet Devices, Inc. [Cl. 93-1]

A method is described for the fabrication of a pallet which consists of a rectangular platform of 60-point kraft board supported on short columns of thick-walled paper tubing. Adhesively coated tongues, which are positioned on the under surface of the platform, are bent into right-angle position within the interior of the associated columns; the tongues are then pressed outwardly into adhesive engagement with the columns. 9 figures. E.G.S.

CLARKE, JOHN D. Container and display insert. U. S. patent 2,531,255. Filed March 7, 1945. Issued Nov. 21, 1950. 3 claims. Assigned to Morris Paper Mills. [Cl. 229-23]

A display carton incorporates spaced-apart side end walls; outer side- and end-wall sections are inclined upwardly and inwardly with respect to top spacer sections which are slanted downwardly and inwardly. 7 figures. E.G.S.

CURRIE, GROVER C. Bottle carton. U. S. patent 2,529,725. Filed Sept. 10, 1948. Issued Nov. 14, 1950. 3 claims. Assigned to Dacam Corporation. [Cl. 229-52]

A cardboard carton for bottled beverages incorporates hand holes in each of its end walls. 6 figures. E.G.S.

EBERT, LUDWIG, and BENCHLEY, ROBERT, JR. Collapsible cardboard display device. U. S. patent 2,530,950. Filed Nov. 17, 1948. Issued Nov. 21, 1950. 2 claims. Assigned to Einson-Freeman Co., Inc. [Cl. 40-124.1]

A collapsible cardboard display device consists of an upright poster which is supported at its lower end by a collapsible, triangular base structure. 8 figures. E.G.S.

RUTH, HOWARD M. Tampon applicators. Canadian patent 469,553. Filed Oct. 19, 1946. Issued Nov. 21, 1950. 1 claim. Assigned to International Cellucotton Products Company.

This is the same as U. S. patent 2,489,502; *cf.* B.I.P.C. 20: 362. E.G.S.

VOGEL, PAUL R. Cardholder. U. S. patent 2,532,132. Filed Oct. 10, 1946. Issued Nov. 28, 1950. 3 claims. [Cl. 40-124]

A cardboard display holder for greeting cards or photographs includes means for mounting cards of the same or different sizes on either or both sides of the holder. 4 figures. E.G.S.

WILLIAMSON, MARSHALL I. Display container. U. S. patent 2,532,216. Filed Aug. 4, 1948. Issued Nov. 28, 1950. 4 claims. [Cl. 206-44; changed to 206-45.25]

A collapsible display receptacle is formed from a single cardboard blank which is configurated to provide a display-forming section and a bin-completing section which extends integrally from one end of the display-forming section. 8 figures. E.G.S.

CHLORINE DIOXIDE

HUTCHINSON, WILLIS S. Process for generation of chlorine dioxide. U. S. patent 2,530,468. Filed Oct. 21, 1947. Issued Nov. 21, 1950. 6 claims. Assigned to Mathieson Chemical Corporation. [Cl. 23-152]

A process for the generation of chlorine dioxide comprises the steps of causing nitrogen dioxide to react with the chlorite of an alkali or alkaline earth metal (e.g., sodium chlorite) to form chlorine dioxide and the corresponding nitrite; combining sulfuric acid with the nitrite to liberate a mixture of nitric oxide and nitrogen dioxide; oxidizing the nitric oxide to nitrogen dioxide by mixing with excess air; and recycling the resultant nitrogen dioxide-air mixture in contact with additional chlorite to generate more chlorine dioxide. 1 figure. E.G.S.

DISPENSING CONTAINERS

ILIFF, KATHRYN C. Powdered soap container. U. S. patent 2,528,830. Filed Oct. 21, 1946. Issued Nov. 7, 1950. 1 claim. [Cl. 229-11]

A rhombus-shaped, coated cardboard or plastic container for the dispensing of powdered soap is provided with a perforated, overhanging end section through which the powdered material may be dispensed. 8 figures. E.G.S.

TAGGART, DONALD C. Folded tissues and dispenser therefor. U. S. patent 2,529,853. Filed Feb. 15, 1946. Issued Nov. 14, 1950. 1 claim. Assigned to The General Cellulose Company, Inc. [Cl. 206-57]

A dispensing carton for folded tissues has a tear-out portion and contains a stack of sheets, each of which is arranged in such a manner that individual sheets can be withdrawn from the dispenser after the tear-out portion has been removed. 4 figures. E.G.S.

DYES AND DYEING

THOMAS, RICHARD. Method of treating paper and the resulting products. U. S. patent 2,528,324. Filed April 10, 1946. Issued Oct. 31, 1950. 10 claims. Assigned to Lever Brothers Company. [Cl. 117-33.5]

This corresponds to Canadian patent 444,647; *cf.* B.I.P.C. 18: 208. E.G.S.

ELECTRONICS

ROMAN, WALTER G. Electronic control system for dynamoelectric machinery. U. S. patent 2,530,994. Filed April 19, 1949. Issued

Nov. 21, 1950. 13 claims. Assigned to Westinghouse Electric Corporation. [Cl. 318-345; changed to 318-317]

An electronic system is adapted for the operational control or regulation of dynamoelectric machinery (e.g., a papermaking machine) by a direct current which is supplied from an a.c. source and which is controlled by an output magnitude of the machinery. Although the control system not only receives a d.c. input under the control of the machine but also applies a d.c. output to the machine, there is interposed between the d.c. input and output ends a network of tube circuits which are energized by an alternating current and which are equipped with an inductive coupling that mutually isolates the input and output ends. 5 figures. E.G.S.

FOLDING BOXES

ANDREWS, EDWARD D. Package construction. U. S. patent 2,527,692. Filed Dec. 1, 1948. Issued Oct. 31, 1950. 2 claims. Assigned to The Quaker Oats Company. [Cl. 229-14]

A small, individual, moisture-vapor resistant package for breakfast cereals consists of an open-end cardboard sleeve which is enclosed in a moisture-resistant wrapper (e.g., cellophane, rubber hydrochloride, or waxed paper). 10 figures. E.G.S.

BERGSTEIN, ROBERT M. Carton and method of making it. U. S. patent 2,529,128. Filed Aug. 6, 1945. Issued Nov. 7, 1950. 3 claims. Assigned to Robert M. Bergstein and Frank Bergstein. [Cl. 229-23]

A window carton is provided with three paperboard walls and a fourth wall of transparent cellulose acetate sheeting; the transparent wall is a true structural component of the box, which would not be self-sustaining without it. 7 figures. E.G.S.

BRULIN, LAURENCE W. Construction of cartons. U. S. patent 2,529,675. Filed Sept. 8, 1948. Issued Nov. 14, 1950. 2 claims. [Cl. 229-52]

A cardboard carton is constructed in such a manner that load-bearing areas are reduced in size, with the result that compressional and torsional loads may be reduced to a minimum, and a comparatively high structural strength can be obtained with a relatively light cardboard. 5 figures. E.G.S.

CRARY, JAY D., and MATHERS, HARRY M. Paperboard box. U. S. patent 2,527,705. Filed May 27, 1946. Issued Oct. 31, 1950. 1 claim. Assigned to Paper Strap Inc. [Cl. 229-45]

A paperboard box for cakes, pies, and similar bakery products incorporates a closure and handle arrangement which comprises a loop of edge-folded paper strap adapted to be slipped over the box and means integral with the end flaps of the box for holding the arrangement in operative position on the box. In order to facilitate the sliding of the handle onto the box, the box blank is preferably scored in such a manner that the rear wall has a slightly smaller cross-sectional area than the front wall. 9 figures. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,529,147. Filed Feb. 27, 1945. Issued Nov. 7, 1950. 13 claims. [Cl. 229-34]

A foldable cardboard carton for multidiameter articles is designed in such

a manner that the various diameters of the packaged articles co-operate with portions of the carton to prevent the relative movement of the articles and the carton. 14 figures. E.G.S.

GIBSON, FREDERIC H. Container for carbon paper and similar sheet material. U. S. patent 2,529,288. Filed June 13, 1947. Issued Nov. 7, 1950. 2 claims. Assigned one half to Fred H. Mahler. [Cl. 206-62]

A cardboard container is designed to enclose and protect a stack of carbon paper sheets and maintain it in padlike form. 6 figures. E.G.S.

GOODYEAR, CHARLES H. Tray type collapsible carton. U. S. patent 2,531,507. Filed Nov. 13, 1948. Issued Nov. 28, 1950. 2 claims. Assigned to Fibreboard Products Inc. [Cl. 229-33]

A paperboard carton for frozen foods includes means for locking the cover part to the tray part after the carton is filled. The carton is constructed in such a manner that the tray walls will remain erect when they are set up. 8 figures. E.G.S.

GUYER, REYNOLDS. Methods and apparatus for forming cartons. Canadian patent 469,249. Filed Aug. 2, 1946. Issued Nov. 7, 1950. 16 claims. Assigned to Waldorf Paper Products Company.

This is the same as U. S. patent 2,516,624; *cf.* B.I.P.C. 20: 921. E.G.S.

MCDERMOTT, RICHARD W. Container. U. S. patent 2,528,603. Filed Nov. 16, 1945. Issued Nov. 7, 1950. 6 claims. Assigned to National Folding Box Company. [Cl. 229-37]

A radio-tube carton comprises enclosing side-wall panels and erectable, collapsible end structures which are adapted to hold a radio tube securely in position out of contact with the side and end walls of the carton. The outside dimensions of the carton can be standardized; at the same time the interior can be adjusted to accommodate tubes of various shapes and sizes. 9 figures. E.G.S.

MELLER, REGINALD B. Construction of containers. U. S. patent 2,528,900. Filed Feb. 26, 1945. Issued Nov. 7, 1950. 7 claims. Assigned to Bemiss-Jason Company. [Cl. 229-35]

A carton for the packaging of loose, bulk products (e.g., potato chips) incorporates a corner-locking construction which is designed to permit the empty or filled containers to be stacked without the side or end elements spreading away from one another. 15 figures. E.G.S.

SMITH, CHARLES S. Folded partitioned tray with transparent wrapper. U. S. patent 2,528,016. Filed March 19, 1946. Issued Oct. 31, 1950. 7 claims. [Cl. 206-45.33]

A rectangular cardboard box is provided with an interior wall or walls which delineate a compartment into which an irregularly shaped sandwich, cake section, or other edible product may be positioned and held against displacement; in this manner the product is protected against crushing, breakage, or other damage during the wrapping and handling operations. The filled tray or carton is enclosed in a transparent wrapper (e.g., cellophane). 3 figures. E.G.S.

TICHENOR, HAROLD D. Egg case. U. S. patent 2,528,256. Filed June 7, 1948. Issued Oct. 31, 1950. 1 claim. Assigned to Wabash Fibre Box Co. [Cl. 229-39]

An egg case is formed from two sheets of corrugated board. One of the blanks comprises a body portion which is scored to form outer end- and side-wall panels and which is provided on one side with inwardly foldable flaps adapted to form inner side- and end-wall panels; spaced bottom flaps which are located along the opposite side are adapted to be folded inwardly into overlapping relationship to provide a double-thickness bottom. The other blank comprises a body portion which is scored to provide two central panels and two end panels; the former can be folded into superposed relation to form a central partition which divides the interior of the egg case into two compartments, and the latter are designed to serve as hinged covers for the respective compartments. 9 figures. E.G.S.

TURNER, WILLIAM E. Bobbin box. U. S. patent 2,531,090. Filed May 1, 1948. Issued Nov. 21, 1950. 6 claims. Assigned to O. B. Andrews Company. [Cl. 229-27]

A bobbin box is formed from an integral paperboard blank and is designed to accommodate four bobbins. 6 figures. E.G.S.

WAUDA, GEORGE E. Carton. U. S. patent 2,527,167. Filed Oct. 15, 1947. Issued Oct. 24, 1950. 2 claims. Assigned to Marathon Corporation. [Cl. 229-36]

A paperboard carton for frozen foods includes a tray or receptacle portion and a hinged cover which is provided with positive, releasable locking means for retaining the cover in the closed position. 6 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

SANFORD, ROY S. Paper container. U. S. patent 2,530,787. Filed Dec. 6, 1945. Issued Nov. 21, 1950. 8 claims. Assigned one half to Ex-Cell-O Corporation and one half to a group comprising Ace C. Fessenden and Ace Carton Corporation. [Cl. 229-5.5]

The end flaps of a liquidtight or siftproof paperboard container are coated uniformly with an adhesive and then pressed together firmly to cause the adhesive to flow and seal the pinholes and cracks. 5 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

BELCHER, DANIEL, WILLIAMS, RUSSELL J., and VOEGE, JAMES E. Apparatus for manufacturing valve bags. U. S. patent 2,527,295. Filed June 25, 1947. Issued Oct. 24, 1950. 38 claims. Assigned to Bemis Bro. Bag Company. [Cl. 93-8]

An apparatus is adapted for the continuous, automatic production of valve bags of the type which have a valve sleeve affixed at a corner; the equipment is designed particularly for the stitching of sleeves to bags which have gusset sides. 49 figures. E.G.S.

CUMMINGS, ROY W., and BURKE, GEORGE F. C. Article-forming system. U. S. patent 2,531,555. Filed May 3, 1946. Issued Nov. 28, 1950. 51 claims. Assigned to United Shoe Machinery Corporation. [Cl. 93-1; changed to 93-84]

An apparatus is adapted for the high-speed production of corrugated paper filters for gas masks. 35 figures. E.G.S.

DAVIS, WILLIAM L. Adjustable cam mechanism. U. S. patent 2,528,344. Filed July 17, 1948. Issued Oct. 31, 1950. 7 claims. Assigned to Union Bag & Paper Corporation. [Cl. 74-568]

An adjustable cam mechanism is used in conjunction with the opening cylinder assembly of a paper bag-making machine to vary the axial and radial movements for different size bags. 2 figures. E.G.S.

GONIA, HAROLD A. Machine for decurling labels. U. S. patent 2,531,619. Filed June 28, 1946. Issued Nov. 28, 1950. 1 claim. Assigned to Beech-Nut Packing Company. [Cl. 92-70]

An apparatus is adapted for the flattening or decurling of paper labels for chewing gum packages. 3 figures. E.G.S.

HOWARD, STANLEY R. Container forming machine. U. S. patent 2,529,732. Filed April 15, 1947. Issued Nov. 14, 1950. 17 claims. Assigned to Pneumatic Scale Corporation. [Cl. 154-1; changed to 154-42]

A tea-bagging machine is equipped with a heat-sealing apparatus which embodies co-operating heat-sealing or pressure-applying elements particularly adapted for sealing together the contacting portions of a relatively thin, porous, heat-sealable, fibrous, bag-forming material. 8 figures. E.G.S.

LAGER, ERIC W., PROHASKA, JAMES J., and HAASE, HEINRICH E. Method and mechanism for closing fiber containers with a lined closure. U. S. patent 2,531,914. Filed Feb. 1, 1945. Issued Nov. 28, 1950. 22 claims. Assigned to Swift & Company. [Cl. 226-80; changed to 226-81]

A machine is provided for producing a tacky bead around the open end of a cylindrical fiber container, applying a liner over the open end, and placing a cap over the liner to close the container. The invention is particularly adapted for use in the manufacture of containers for shortening. 12 figures. E.G.S.

MAY, GEORGE. Apparatus for building up structural elements from paper sheets. U. S. patent 2,527,752. Filed Sept. 8, 1947. Issued Oct. 31, 1950. 7 claims. Assigned to Dufay-Chromex Limited. [Cl. 154-1]

An apparatus is adapted for the fabrication of structural elements (e.g., doors, walls, partitions, or parts or fittings for aircraft, such as streamline tanks and nacelles) from paper sheets. The invention is related to the method of U. S. patent 2,428,979; *cf.* B.I.P.C. 18: 207. 11 figures. E.G.S.

MUENCH, CARL G. Apparatus for saturating edge portions of fiberboards. U. S. patent 2,530,026. Filed Oct. 25, 1945. Issued Nov. 14, 1950. 4 claims. Assigned to The Celotex Corporation. [Cl. 91-43]

An apparatus for the saturation of the edges of fiber insulating board comprises means for feeding successive sheets in horizontal position into

a vertical hopper to form a pile of sheets, the edges of which are exposed. The hopper, to at least a portion of its height, is provided with suitable openings, so that by surrounding a portion of the hopper with a suitable enclosure, the saturant may be fed into the enclosure to flow through the openings in the hopper wall and to come in contact with the edges of the stack of material. Means are included for the continuous removal of the saturated boards from the bottom of the vertical stack. 4 figures. E.G.S.

MACHINERY—CUTTERS

YOUNG, IRVIN L. Paper-cutting machine. U. S. patent 2,530,319. Filed Nov. 16, 1945. Issued Nov. 14, 1950. 8 claims. [Cl. 164-28; changed to 164-61]

A machine is adapted for the cutting of a continuous paper web into seals or stickers for packages, wrappers, and the like. 3 figures. E.G.S.

MACHINERY—GUIDE ROLLS

HORNBOSTEL, LLOYD. Web guide. U. S. patent 2,530,122. Filed May 26, 1948. Issued Nov. 14, 1950. 6 claims. Assigned to Beloit Iron Works. [Cl. 74-241]

A web guide is designed to retain a papermaking felt or wire in proper alignment as it travels over supporting rolls; the apparatus is adapted to be actuated by hydraulic, remote control. 5 figures. E.G.S.

HORNBOSTEL, LLOYD. Wire guides. Canadian patent 469,481. Filed Jan. 23, 1948. Issued Nov. 21, 1950. 10 claims. Assigned to Beloit Iron Works.

This is the same as U. S. patent 2,488,294; *cf.* B.I.P.C. 20: 287-8. E.G.S.

MACHINERY—PACKAGING MACHINERY

KINDSETH, HAROLD V. Bag openers. Canadian patent 469,029. Filed May 10, 1948. Issued Oct. 31, 1950. 8 claims. Assigned to Bemis Bro. Bag Company.

A device is adapted for the opening or expanding of cellophane bags (e.g., for nuts, candy, and the like) prior to a filling operation. The unit includes a filling hopper with a funnel-like discharge opening which is designed to deliver material into the open mouth of a bag after the bag opener has been actuated to expand the walls of the empty bag. 10 figures. E.G.S.

WEST, JOHN B. Straw packaging machine. U. S. patent 2,528,930. Filed June 14, 1946. Issued Nov. 7, 1950. 4 claims. Assigned to Maryland Paper Products Company, Inc. [Cl. 93-3]

A machine is adapted for forming paper wrappers for drinking straws, placing one or more straws therein, and sealing the ends of the wrappers. Means are included for cutting the continuous wrapper into sections of predetermined length and pushing them into a dropping device which drops the wrappers into a rotary wrapper receiver. 26 figures. E.G.S.

MACHINERY—PAPER MACHINE—CYLINDER MOLD

TEMPERLEY, JOHN. Apparatus for the manufacture of paper. U. S. patent 2,528,189. Filed Nov. 27, 1945. Issued Oct. 31, 1950. 6 claims. Assigned to Walmsleys (Bury) Limited. [Cl. 92-43]

This corresponds to Canadian patent 443,686; *cf.* B.I.P.C. 18: 69.
E.G.S.

MACHINERY—PULPERS

STAPLEY, STEPHEN G., and SUBART, WILLIAM. Pulping machine. U. S. patent 2,527,772. Filed May 6, 1947. Issued Oct. 31, 1950. 4 claims. Assigned to E. D. Jones & Sons Company. [Cl. 92-26]

This corresponds to Canadian patent 466,359; *cf.* B.I.P.C. 20: 925-6.
E.G.S.

MACHINERY—SLITTERS AND WINDERS

PEARSON, CHARLES M. Web threader for winder machines. U. S. patent 2,529,184. Filed Sept. 15, 1949. Issued Nov. 7, 1950. 5 claims. Assigned to The Bagley & Sewall Company. [Cl. 271-2.1; changed to 242-66]

A web-threading device for drum winders functions to thread the leading portion of a paper web around a supporting drum; the unit normally does not engage the paper web or the drum, but can be moved into engagement with the web to direct it around the drum and upwardly to the winding roll. 4 figures. E.G.S.

THOMSON, WILLIAM R. Paper reeling method and apparatus. U. S. patent 2,528,713. Filed Dec. 21, 1946. Issued Nov. 7, 1950. 10 claims. [Cl. 242-65]

The apparatus is the same as that described in Canadian patent 448,833; *cf.* B.I.P.C. 18: 806. The method of reeling paper on a reel bar utilizing a reel drum comprises the successive steps of placing the reel bar in adjacent, parallel, noncontacting relation to the drum; swinging the reel bar in an arcuate direction so that it makes contact with the drum; directing a paper web between the reel bar and drum to initiate formation of a roll of paper on the reel bar; again swinging the reel bar in an arcuate direction to another position immediately after the formation of the paper roll has been initiated, while continuously maintaining the roll in contact with the drum; and supporting the reel bar in the latter position until the formation of the roll has been completed. 5 figures. E.G.S.

MACHINERY—VORTRAP

SCHILLING, FREDERICK B. Separating apparatus. U. S. patent 2,530,181. Filed July 29, 1947. Issued Nov. 14, 1950. 1 claim. Assigned to Nichols Engineering & Research Corporation. [Cl. 209-211]

A vortex-type separator for pulp suspensions is provided with a rotary valve mechanism in combination with a waste chamber and a suitable water inlet for the continuous, controlled, measured passage of waste. The settling qualities of the waste-receiving chamber are not disturbed by this arrangement. 4 figures. E.G.S.

MACHINERY—WAXING MACHINE

LACH, JOHN. Apparatus for coating paper with carbon wax. U. S. patent 2,529,699. Filed Sept. 12, 1947. Issued Nov. 14, 1950. 4 claims. Assigned to Uarco Incorporated. [Cl. 91-30]

An apparatus is provided for the application of a uniform coating of carbon wax to one side of a continuous, thin paper web which is advanced from a supply roll around a cooling drum onto a takeup roll. Means are also

included for maintaining a uniform mixture of the wax at a constant temperature. 5 figures. E.G.S.

MATERIALS HANDLING

CHAPMAN, RALPH. Press unloaders and shutters. Canadian patent 469,174. Filed June 24, 1948. Issued Nov. 7, 1950. 23 claims. Assigned to Chapman Forest Utilization, Inc.

A machine is adapted for the removal of dried, compressed, consolidated fiberboard sheets from a multiple-platen press; the unit operates automatically to receive the entire charge from the press and to unload the sheets individually onto a conveyor. 15 figures. E.G.S.

METERS AND RECORDERS

COURVOISIER, FRÉDÉRIC. Determination of moisture contents. U. S. patent 2,532,010. Filed July 1, 1947. Issued Nov. 28, 1950. 12 claims. [Cl. 34-25]

A device is designed for the determination of the moisture content of a running paper or fabric web. Means are provided for the application of the electrostatic voltage produced on the running web to a variable condenser which is periodically oscillated by an electrodynamic drive; the electrostatic voltage is transformed into an alternating voltage which is proportional to the electrostatic potential. A thermionic amplifier serves to amplify the alternating voltage; the amplified voltage actuates an instrument for the measurement or adjustment of the moisture content of the web. 8 figures. E.G.S.

MOLDED PULP ARTICLES

COX, JOHN W. Carton. U. S. patent 2,529,140. Filed Nov. 22, 1947. Issued Nov. 7, 1950. 10 claims. Assigned to Shellmar Products Corporation. [Cl. 229-2.5]

A cellular, molded-pulp egg carton is adapted to fit into a standard egg case and has a top bracing structure combined with a locking means which co-operates with the bracing structure to prevent any appreciable relative movement between the top and bottom sections of the carton. 7 figures. E.G.S.

PACKAGING

DENISON, WILLIAM E. Double compartment nesting band package. U. S. patent 2,529,837. Filed Dec. 10, 1947. Issued Nov. 14, 1950. 12 claims. Assigned to Tammen and Denison, Inc. [Cl. 99-171]

A double-compartment, nesting-band package for oleomargarine and a coloring substance is formed from a heat-sealable material. The essential feature of the package consists of two nesting bands or rings, each of which engages one wall of the wrapper; as a result of the nesting arrangement, a compartment is formed between the two walls of the wrapper inside the rings or bands. 6 figures. E.G.S.

PIAZZE, THOMAS E. Sealed tobacco package. U. S. patent 2,528,778. Filed March 1, 1945. Issued Nov. 7, 1950. 1 claim. Assigned to Shellmar Products Corporation. [Cl. 206-48.5]

A tobacco pouch is formed by folding a sheet of laminated, heat-sealable material (e.g., Pliofilm or cellophane laminated to glassine by means of a

microcrystalline wax) into a tube, sealing the tube transversely along one marginal end, and placing a secondary transverse seal at a substantial distance inward from the marginal end seal to provide a protective, stiffening flap of the excess material between the seals. The microcrystalline wax serves as a moisture-vapor barrier between the laminated sheets. 8 figures. E.G.S.

PAPER—COATED

BARRETT, WILLIAM H., and ASDELL, BERNARD K. Process of coating paper. U. S. patent 2,532,140. Filed Nov. 24, 1943. Issued Nov. 28, 1950. 5 claims. Assigned to Minnesota and Ontario Paper Company. [Cl. 117-103]

A method for the application of a mineral coating which has a solids content of 61-72% to a traveling web of paper which has a moisture content of 2-10% comprises the steps of applying the mineral coating to a rotatable, resilient surface; transferring the coating on the resilient surface to the paper web; drawing the web over a heated drier drum; and redistributing the moisture content of the coated web while it is on the drier drum by means of a moving felt after the coating has received a preliminary set. 2 figures. E.G.S.

KNIGHT, GEORGE D., and ROWLAND, BEN W. Art of coating. Canadian patent 469, 201. Filed May 29, 1948. Issued Nov. 7, 1950. 13 claims. Assigned to The Institute of Paper Chemistry.

This corresponds to U. S. patent 2,471,330; *cf.* B.I.P.C. 19: 745. E.G.S.

PAPER—COATED (HOT-MELT)

BUMP, CHARLES K., and BISCHOFF, GEORGE H. Hot melt coating composition. U. S. patent 2,527,793. Filed Feb. 28, 1948. Issued Oct. 31, 1950. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 260-23]

A silicone-modified, polyvinyl acetal hot-melt coating composition (e.g., for glass, paper, wood, metal, fabrics, etc.) has high adhesive qualities together with a minimum of tackiness at ordinary temperatures. A typical composition comprises 100 parts of polyvinyl butyral, 160 parts of hydrogenated castor oil, 150 parts of stearamide, 60 parts of butyl benzyl phthalate, 260 parts of ester gum, and 5 parts of dimethyl silicone polymer (all parts by weight). E.G.S.

SIDO, GEORGE R., and MURPHY, JOHN F. Hot melt compositions. U. S. patent 2,527,856. Filed July 14, 1948. Issued Oct. 31, 1950. 9 claims. Assigned to Monsanto Chemical Company. [Cl. 260-27; changed to 260-23]

A hot-melt composition is adapted for the coating of glass, metal, textiles, paper, wood, and the like. As an example, the composition comprises 100 parts of polyvinyl butyral, 260 parts of hydrogenated castor oil, 360 parts of esterified polymerized rosin, 27 parts of dioctyl phthalate, and 27 parts of the methyl ether of a *p*-toluenesulfonamide-formaldehyde condensation product (all parts by weight). Good adhesiveness and resistance to aging are claimed. E.G.S.

PAPER—COATED (WRINKLE COATING)

WILLIAMS, GORDON M. Method of polymerizing nonwrinkling oils to wrinkling oils. U. S. patent 2,528,936. Filed April 9, 1947.

Issued Nov. 7, 1950. 11 claims. Assigned to New Wrinkle, Inc. [Cl. 260-407; changed to 106-222]

A method of treating a vegetable fatty oil (e.g., soybean or sunflower oil) to increase its drying rate and transform it into a wrinkling oil comprises the steps of heating the oil in an inert ambient atmosphere at 120°C. to remove water from the oil; cooling the oil to room temperature; adding 0.15 part by weight of finely divided copper; heating the mixture to about 150° under constant agitation; and holding the temperature of the mixture at this level for about three hours. E.G.S.

WILLIAMS, GORDON M. Wrinkling oils. U. S. patent 2,528,937. Filed April 9, 1947. Issued Nov. 7, 1950. 6 claims. Assigned to New Wrinkle, Inc. [Cl. 260-407; changed to 106-222]

A wrinkling oil is prepared by adding 0.05 part by weight of sodium to 100 parts by weight of vegetable fatty oils (e.g., soybean or sunflower oil) and heating to 120°C. in an inert ambient atmosphere. E.G.S.

PAPER SPECIALTIES

ARKELL, WILLIAM C. Composite material. U. S. patent 2,531,931. Filed June 1, 1946. Issued Nov. 28, 1950. 8 claims. Assigned to Arkell Safety Bag Company. [Cl. 154-55]

A composite sheet material is adapted for use in bandages, diapers, blankets, sleeping bags, face cloths, and wrappings for packing glass and other fragile articles. The material comprises a paper web which has transverse crinkles to provide for longitudinal stretchability, and flattened, longitudinal corrugations to provide for transverse stretchability; the crinkles and corrugations also provide stretchability in all directions. Unspun cotton fiber webs are secured to both sides of the paper web by means of lines of adhesive applied to the crests of the corrugations; the portions of each cotton fiber web between the corrugations are left unsecured, so as to provide more or less dead air spaces between the cotton webs and the paper. 4 figures. E.G.S.

BERGQUIST, CARL G. Self-acting closure. U. S. patent 2,528,332. Filed July 3, 1947. Issued Oct. 31, 1950. 4 claims. Assigned to Electrolux Corporation. [Cl. 229-43]

A receptacle closure is designed for use as a shelf-closing mouth for a disposable, porous-paper, dust-separating receptacle for tank-type vacuum cleaners. The closure member consists of a number of partially independent flexible fingers which co-operate in automatically flexing into a common plane adjacent to the plane of a receptacle aperture and closing the aperture. 6 figures. E.G.S.

DAHL, RALPH T. Liner for mess kit covers. U. S. patent 2,531,671. Filed Oct. 7, 1946. Issued Nov. 28, 1950. 1 claim. [Cl. 65-15]

A moisture-resistant, thin parchment liner for mess kits is adapted to fit into one of the semioval pockets of the conventional two-part receptacle. 3 figures. E.G.S.

DOMENACH, LOUIS, and MACARDIER, LOUIS. Thin paper insulated electric cable. U. S. patent 2,532,152. Filed Sept. 11, 1946. Issued Nov. 28, 1950. 12 claims. Assigned to Compagnie Générale d'Électricité. [Cl. 174-25]

A high-voltage electric cable comprises a conductor, an enclosing sheath, and a dielectric layer between the conductor and the sheath. The layer consists of wound narrow strips of thin rag paper (made from flax waste) and oil under high pressure (e.g., 10-20 kg./sq. cm.); the strips which are located near the conductor are about 0.007 mm. thick. 3 figures. E.G.S.

FRAMPTON, JOHN A. Envelope. U. S. patent 2,527,925. Filed Nov. 20, 1946. Issued Oct. 31, 1950. 3 claims. [Cl. 229-73]

A return envelope is designed to be sent initially as third-class mail, with the closure flap inserted into the envelope to prevent the loss of the contents; the envelope is returned as first-class mail, with the flap withdrawn and sealed. 5 figures. E.G.S.

GIBNEY, ROBERT B. Electrographic recording. U. S. patent 2,530,956. Filed Aug. 6, 1946. Issued Nov. 21, 1950. 7 claims. Assigned to Bell Telephone Laboratories, Incorporated. [Cl. 204-2]

An electrographic recording medium comprises two dry paper sheets in face-to-face contact, each impregnated with a mixture of acetamide (100 parts) and formamide (10 parts); one of the sheets is also impregnated with Victoria blue dye, in the proportion of about two parts of dye per 100 parts of acetamide. It is claimed that the recording medium will provide clear, stable marks of high definition when acted upon by high-potential, low-density currents. 4 figures. E.G.S.

JONES, JOHN P. Cream remover. U. S. patent 2,531,630. Filed June 18, 1945. Issued Nov. 28, 1950. 9 claims. Assigned to Dairy Specialties, Inc. [Cl. 222-528; changed to 222-484]

A cream-remover attachment for a paper milk container consists of a discharge spout, a discharge opening, and an air inlet, all of which are sealed within the container until it is opened for pouring. 5 figures. E.G.S.

KIECKHEFER, ROBERT J. Nested cup. U. S. patent 2,530,124. Filed May 29, 1944. Issued Nov. 14, 1950. 5 claims. Assigned to American Lace Paper Company. [Cl. 206-65; changed to 229-2.5]

Each cup in a stack of nested, molded-pulp cups is formed in such a manner that the major length of its side wall comprises the frustum of a cone which bears a 7° angle with the axis of the cone. The bottom of the cup is integral with the side wall, and the inner surfaces merge on a broad curve. In order to overcome wedging of the nested cups, the outer lower portion of each cup is provided with a cylindrical surface which deviates from the general frustoconical external surface of the wall. 3 figures. E.G.S.

KLINE, BERNARD L. Electrosensitive recording blank. U. S. patent 2,528,005. Filed May 14, 1948. Issued Oct. 31, 1950. 6 claims. Assigned to The Western Union Telegraph Company. [Cl. 204-2]

An electrosensitive recording blank comprises an electrically conductive, highly calendered paper sheet which is coated with a recording medium such as cuprous thiocyanate (0.5-0.75 g./sq. ft. of recording surface); when an electrical signaling potential is applied to selected elemental areas of the recording surface, a color change will occur in the selected areas so as to produce a record of the potential applied to the areas. The paper sheet is rendered electrically conductive by impregnation with an electrolyte or by interspersion with a finely divided metal powder or carbon (e.g., carbon black). 3 figures. E.G.S.

MOSES, EDMUND Q. Plaster of Paris containing paper and method of making. U. S. patent 2,530,986. Filed Aug. 12, 1944. Issued Nov. 21, 1950. 7 claims. [Cl. 92-3]

A process for making a fibrous, paperlike material which contains plaster of Paris consists in beating a paper pulp with gypsum in amounts up to 50% of the total volume of paper, forming the mixture into a paper sheet, drying the sheet, and heating it to 120-130°F. to convert the gypsum into plaster of Paris. 4 figures. E.G.S.

ROPER, AMUND S. Duplex bag bodies. Canadian patent 469,026. Filed April 9, 1948. Issued Oct. 31, 1950. 1 claim. Assigned to Bemis Bro. Bag Company.

This is the same as U. S. patent 2,502,481; *cf.* B.I.P.C. 20: 690. E.G.S.

ROUSH, JOHN H. Package wrapper. U. S. patent 2,527,685. Filed Sept. 6, 1946. Issued Oct. 31, 1950. 1 claim. [Cl. 229-40]

A plain or decorative paper wrapper is adapted for the packaging of books, papers, magazines, or the like to protect them during shipment or storage. 2 figures. E.G.S.

SCHENCK, ARTHUR E. Container closures. Canadian patent 469,028. Filed May 4, 1948. Issued Oct. 31, 1950. 1 claim. Assigned to Bemis Bro. Bag Company.

A tin-tie closure is provided for flexible-walled containers in which the rear wall of the container or bag body is extended upwardly above the remaining walls to receive a metallic strip, and in which the upper end of the rear wall is slightly longer than the metal strip. When the extending wall portion is wrapped around the strip, the latter is completely concealed, and undesirable raw edges are eliminated. 32 figures. E.G.S.

SEMCO, WILLIAM B. Cold waving process. U. S. patent 2,529,886. Filed Feb. 3, 1950. Issued Nov. 14, 1950. 10 claims. Assigned to Artistic Beauty Products Company. [Cl. 132-7]

A high-wet strength paper is impregnated with an indicator (e.g., sodium nitroferricyanide) for thioglycolic acid or its sodium or ammonium salt. The color of the indicator paper is changed from tan to red or purple by the action of trace amounts of thioglycolic acid in hair which has been treated with a cold waving solution and subsequently neutralized. 2 figures. E.G.S.

SPENCER, PERCY L. Receptacle. U. S. patent 2,528,251. Filed March 8, 1947. Issued Oct. 31, 1950. 1 claim. Assigned to Raytheon Manufacturing Company. [Cl. 229-51]

A protective wrapper is adapted for the packaging of foods which are to be heated or cooked in a microwave heating apparatus. The specified packaging material (e.g., rubber hydrochloride, lacquered regenerated cellulose, or waxed paper) has a high tensile strength, is somewhat flexible, and is transparent to electromagnetic energy. 3 figures. E.G.S.

TRILLICH, BERTRAM L. Self-sealing wrapping material. U. S. patent 2,529,060. Filed Nov. 7, 1949. Issued Nov. 7, 1950. 9 claims. Assigned to The Munising Paper Company. [Cl. 117-68.5; changed to 117-43]

A self-sealing wrapping material consists of a flexible, calendered paper sheet, one surface of which is coated with a flexible film or coating of a wax and the other with a film or coating of a cohesive, nonadhesive rubber, such as the film or coating of coalesced rubber particles which are deposited from a dried coating of unvulcanized natural latex. 9 figures. E.G.S.

PAPER SPLICING

DICKHAUT, CHARLES A. Web feeding. Canadian patent 469,429. Filed July 19, 1947. Issued Nov. 14, 1950. 22 claims. Assigned to John Waldron Corporation.

A method and apparatus are described for unwinding a web from a roll of stock, and simultaneously feeding the web to a treating operation, such as a coating process. The objects of the invention are to avoid an interruption of the continuity of the treating operation when the end of a roll of stock web is reached, to supply a continuous web to the treating operation, and to splice the outer end of a fresh roll to the inner end of a treated web on the run at treating speed. 6 figures. E.G.S.

PEAT

HELLAND, JOHN G., and MOEN, RAGNAR E. L. Preparation of a heat insulating material from peat. U. S. patent 2,529,335. Filed Dec. 29, 1947. Issued Nov. 7, 1950. 2 claims. [Cl. 92-6; changed to 92-9]

A uniform, water-repellent, heat-insulating material is produced from bog-moss peat by the following process: The raw peat is heated in a moist atmosphere to about 80°C., rinsed with water at about 80°, and dried at a temperature not above 30° to a moisture content of about 35-40%; the peat is further dried by a gradual increase in the temperature to 60-90°; and the resultant dried peat is heated to a temperature of 120-140°. E.G.S.

SETUP BOXES

BYCK, JACQUES. Ornamental box. U. S. patent 2,531,968. Filed March 2, 1948. Issued Nov. 28, 1950. 1 claim. [Cl. 229-8]

A decorative cardboard box is provided with a cover, the outer surface of which is covered with a sheet of thin finishing paper; an ornamental panel of woven colored fabric is mounted centrally on the outer surface of the cover and is framed by a square opening in the finishing paper; a base sheet is disposed between the inner surface of the ornamental panel and the outer surface of the cover. 4 figures. E.G.S.

SHIPPING CONTAINERS

ACKER, RALPH E. Vegetable box. U. S. patent 2,527,784. Filed April 14, 1950. Issued Oct. 31, 1950. 2 claims. Assigned to Container Corporation of America. [Cl. 229-16]

A ventilated, corrugated board container is adapted for use in the handling and shipment of perishable produce, such as prepackaged green vegetables of a light, bulky nature, which require ventilation during shipment and storage. 3 figures. E.G.S.

CARTER, NORMAN. Ventilated cardboard carton. U. S. patent 2,532,085. Filed June 13, 1946. Issued Nov. 28, 1950. 4 claims. [Cl. 229-16]

This corresponds to Canadian patent 455,450; *cf.* B.I.P.C. 19: 669. E.G.S.

CODY, RICHARD J. Shipping and display box. U. S. patent 2,529,595. Filed Jan. 28, 1948. Issued Nov. 14, 1950. 1 claim. Assigned to Federal-Mogul Corporation. [Cl. 229-28]

A cardboard carton is adapted for the packaging and display of crankshaft bearing shells; a Z-shaped partition serves to subdivide the box into separate compartments for each of the four shells of two complete bearings. 5 figures. E.G.S.

MILLER, LELAND C. Shipping crate for animals. U. S. patent 2,530,170. Filed March 15, 1948. Issued Nov. 14, 1950. 3 claims. Assigned to Midwest Game Co., Inc. [Cl. 229-16]

A shipping crate for small animals, such as rabbits, is constructed of paperboard and wire, and is arranged in such a manner that the animal cannot escape by gnawing or chewing through the wall of the crate. 5 figures. E.G.S.

POLGLASE, THOMAS R., and HOEBEKE, HENRY J. Shipping packages for heavy spools. Canadian patent 469,476. Filed May 3, 1949. Issued Nov. 21, 1950. 1 claim. Assigned to Anaconda Wire and Cable Company.

This is the same as U. S. patent 2,482,869; *cf.* B.I.P.C. 20: 149. E.G.S.

SMITH, ROSCOE B. Shipping container. U. S. patent 2,531,792. Filed Dec. 10, 1946. Issued Nov. 28, 1950. 4 claims. Assigned to Hercules Powder Company. [Cl. 229-5.5; changed to 206-46]

A heavy cardboard or laminated paper shipping container for large explosive cartridges (e.g., 5-9 inches in diameter, 16-30 inches long) is constructed in such a manner that the container and the explosive may be lowered directly into a borehole without the necessity of removing the explosive from the container. The invention comprises a tubular receptacle which is adapted to receive at least one half of the total length of the explosive cartridge; a cover is provided to enclose the portion of the explosive cartridge which remains exposed after the insertion of the cartridge into the receptacle. The length of the interior of the receptacle and its cover should preferably be equal to the total length of the explosive cartridge, so that the cartridge will be in abutment with the interior disks which are located at each end of the receptacle. The container is recommended for use in rock quarrying, seismographic work, and deep or oil-well blasting. 5 figures. E.G.S.

WAGNER, GEORGE B. Refrigerated shipping container. U. S. patent 2,528,715. Filed Feb. 6, 1947. Issued Nov. 7, 1950. 11 claims. Assigned to Beekman Industries, Inc. [Cl. 62-91.5]

A refrigerated shipping container for perishable products (e.g., live lobsters) embodies two tubular, telescoping, paperboard walls and a tubular blanket of insulation material which is inserted between the telescoping walls; the outer wall and the blanket incorporate foldable end extensions for closing the ends of the container. The refrigerating unit consists of a block of dry ice enclosed in a gastight, insulated box which is vented at predetermined pressures. 9 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

BURROUGHS, EDWIN E. Bag valve. U. S. patent 2,528,419. Filed July 30, 1948. Issued Oct. 31, 1950. 4 claims. Assigned to St. Regis Paper Company. [Cl. 229-62.5]

A multi-ply, gusseted, sewn-end valve bag incorporates a supplemental sheet in its valve arrangement which is designed to provide an effective closing action in the valve when the bag is filled. 8 figures. E.G.S.

SCHENCK, ARTHUR E. Bag closures. Canadian patent 469,027. Filed May 4, 1948. Issued Oct. 31, 1950. 4 claims. Assigned to Bemis Bro. Bag Company.

A tubular bag body blank of the intucked type includes a relatively wide wall which projects above the top edges of the remaining walls to provide an integral closure flap; the upper marginal edge portions of the intucked walls are disposed at an elevation between the upper and lower edges of the relatively wider walls of the bag, so that when the projecting closure flap is folded into flat engagement with the opposite wall on a line which is coincident with the top edge of that wall, the projecting ends of the intucked walls are simultaneously folded into flat engagement with the front wall and adhered thereto by a suitable thermoplastic adhesive. A closure is effected which is leak- and siftproof. 17 figures. E.G.S.

SHERRILL, ROBERT L. Multiple wall bag bodies. Canadian patent 469,025. Filed Nov. 17, 1947. Issued Oct. 31, 1950. 3 claims. Assigned to Bemis Bro. Bag Company.

A method is described for the formation of a window in a wall of a multiwall paper bag; a transparent patch, which constitutes the window, is bound to the piles of the bag wall in such a manner that leakage or sifting of the contents from the bag around the window is prevented. 10 figures. E.G.S.

STORAGE BATTERIES

DILLEHAY, EDWARD R., and SCHUETZ, ROBERT D. Separator for electric storage batteries. U. S. patent 2,531,504. Filed June 12, 1944. Issued Nov. 28, 1950. 1 claim. Assigned to The Richardson Company. [Cl. 136-145]

A storage-battery separator consists of an absorptive, felted, fibrous sheet which contains at least 85% of cellulosic fibers and which is saturated with partially polymerized furfuryl alcohol containing a wetting agent; the finished sheet contains 25-70% of resin solids, based on the combined weight of the fibrous sheet and resin. 3 figures. E.G.S.

TALL OIL

CHRISTENSON, ROGER M., and GLOYER, STEWART W. Fractionation of tall oil. U. S. patent 2,530,809. Filed Aug. 23, 1949. Issued Nov. 21, 1950. 6 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-97.7; changed to 260-97.6]

A process is adapted for the recovery of sterols and rosin and fatty acids from crude tall oil soap. The crude soap, which contains 5-25% of unsaponifiable matter, is admixed with an isopropyl alcohol-water solution; the unsaponifiable matter, which is rich in sterols, is removed by countercurrent extraction with naphtha (1-20 parts per part of tall oil soap solution) at 80-130°F. The naphtha and alcohol are evaporated from the extraction

products and returned to the process. 5 figures, including 4 ternary diagrams. E.G.S.

CHRISTENSON, ROGER M., and GLOYER, STEWART W. Separation of unsaponifiable matter from tall oil residue. U. S. patent 2,530,810. Filed Aug. 23, 1949. Issued Nov. 21, 1950. 9 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-97.7; changed to 260-97.6]

A method of recovering the sterols and other unsaponifiable constituents from tall oil comprises the steps of saponifying a distillation residue of tall oil containing 20-50% rosin acids, 20-50% fatty acids, and 10-30% unsaponifiable matter; making up the resultant mixture of rosin acid soaps, fatty acid soaps, and unsaponifiable matter as a solution of about 18.5% of the saponified pitch in water and isopropyl alcohol, with the final solution containing about 15-36% isopropyl alcohol; countercurrently extracting the resultant solution with naphtha at about 120°F. to remove the unsaponifiable matter in the solution; and then washing the solution of unsaponifiable matter in naphtha with water to remove residual soaps and other water-soluble constituents. 1 figure. E.G.S.

DYKE, MILTON, and SELF, EDWARD S. Treatment of drilling fluids. Canadian patent 469,565. Filed April 28, 1947. Issued Nov. 21, 1950. 4 claims. Assigned to Oil Well Chemical & Materials Co. Inc.

This is the same as U. S. patent 2,468,657; *cf.* B.I.P.C. 19: 749. E.G.S.

HERKENHOFF, EARL C. Flotation of iron ores. Canadian patent 468,894. Filed Dec. 3, 1943. Issued Oct. 24, 1950. 6 claims. Assigned to American Cyanamid Company.

Tall oil is used as an anionic promoter in the beneficiation by froth flotation of iron ore which contains a silica-bearing gangue. 1 flow diagram. E.G.S.

KALMAN, NICHOLAS L. Method for separating rosin acids from mixed materials. U. S. patent 2,532,101. Filed Dec. 1, 1947. Issued Nov. 28, 1950. 26 claims. Assigned to Pierce Laboratory, Inc. [Cl. 260-97.6]

A method of separating the rosin acids from tall oil comprises the steps of dissolving the tall oil in acetone and precipitating the rosin acids from the acetone solution with cyclohexylamine at 10-30°C. E.G.S.

UNKEFER, GILBERT G. Preparation of metallic soaps. U. S. patent 2,528,803. Filed Aug. 1, 1947. Issued Nov. 7, 1950. 6 claims. Assigned to The Harshaw Chemical Company. [Cl. 260-97.5]

A method is described for the manufacture of metallo-organic compounds by the direct reaction between a carboxylic acid (e.g., naphthenic, stearic, palmitic, oleic, and 2-ethylcaproic acids; tall oil, tall oil acids, rosin, rosin acids, and other commercial mixtures of acids). As an example, to 200 grams of tall oil are added 9 grams of magnesium, 5 grams of methyl alcohol, 5 grams of glacial acetic acid, and 125 grams of mineral spirits. The mixture is refluxed for six hours at 135-140°C. and filtered to remove any excess metal; a solution is obtained which contains 2.35% magnesium, and has an acid value of —0.5 and a total solids content of 68.6%. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

MORTON, THOMAS H., and WARD, FRANK. Fireproofing and creaseproofing of cellulose and protein textiles. U. S. patent 2,530,-261. Filed Nov. 27, 1948. Issued Nov. 14, 1950. 8 claims. Assigned to Courtaulds Limited. [Cl. 8-116.2]

A process for the fire- and creaseproofing of cellulose and protein textile materials comprises the steps of impregnating the materials with an aqueous solution which consists of 5-40% of a nonvolatile, strong, mineral acid (e.g., orthophosphoric, phosphorous, pyrophosphoric, phosphamic, sulfuric, or sulfamic acid) and 8-25% of cyanamide; drying at a temperature below 80°C.; and baking at a temperature of 80-160°, so as to obtain materials containing at least 3% by weight (based on the weight of the materials) of chemically combined mineral acid and cyanamide distributed within the individual fibers of the material. E.G.S.

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